THE IRON AGE

A Review of the Hardware, Iron, Machinery and Metal Trades.

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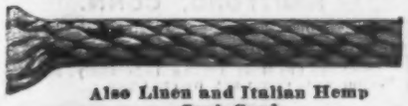

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Ad, Page 23

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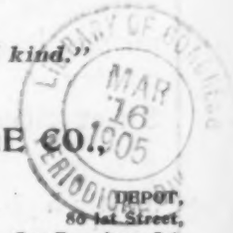

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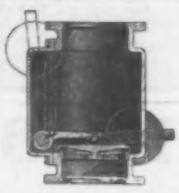

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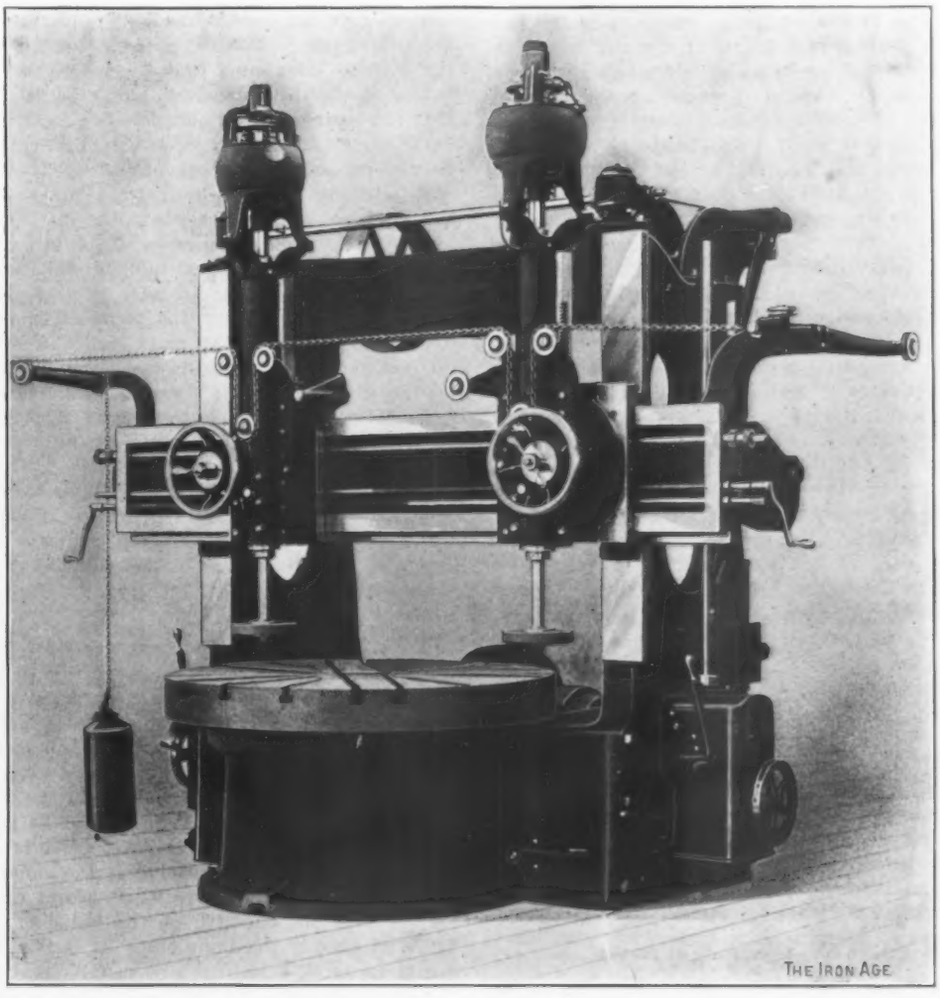
150 to 154 Morgan Street. JERSEY CITY, N. J.

THE IRON AGE

New York, Thursday, March 16, 1905.

Grinding with a Boring Mill.

Two boring mills, modified in design to convert them into grinding machines, were recently built by the Colburn Machine Tool Company, Franklin, Pa., for a large manufacturer of safes. The work for which the tool was particularly intended was the grinding of circular safe doors and their seats to a perfect conical fit, although, as will be appreciated, there are many other grinding operations to which they would be equally well adapted. The safes are made of such extremely hard material that it would be impracticable to machine them with tools, and grinding was the only feasible way of performing the work. The change from normal equipment is indicated in the half-tone, from which it will be seen that the spindles are arranged to rotate, being separately driven by 2 horse-power Northern vertical motors mounted on top of the tool heads. The spindles at their ends carry emery wheels in place of the ordinary tool holders. The spindles can be raised or lowered and inclined at any angle independently, as the motors afford a perfectly flexible drive.



A Colburn Boring Mill Equipped for Grinding Circular Work.

In fitting this mill up for grinding the regular heads were bored out and bronze bushings inserted, one at the top and one at the bottom. These bushings have conical bores and provision is made for taking up wear, so as to preserve the alignment of the spindles. An oiling device is also incorporated which affords lubrication and prevents the oil from overflowing and running down on the spindles. Should it be desirable to use the machine for boring and turning, the spindles and their journals can be quickly removed and the regular tool holders substituted.

The grinding work for which these two machines were built is divided into two parts—the grinding of the seats in the safes themselves and the grinding of the doors, the first being done on a 72-inch mill, and the second on one of a smaller size. The taper on the door and door seat is obtained by swiveling the heads to the required angle—in the first case with the spindles inclined toward one another, and in the second away from one another. The heads being once set at the required angle may be left in that position, so that a perfect fit of the two parts is assured when the grinding is completed.

A boat on Lake Geneva, Switzerland, has an odd system of propulsion. Ordinarily it is driven by a 45 horse-power Diesel engine running at 260 revolutions per minute, but it is started and reversed by electric power. When starting the engine is disconnected from the propeller shaft and drives only the generator and exciter. The generator furnishes current for a motor connected with the propeller shaft, the torque and speed of which are controlled by regulating the excitation. After attaining full speed the motor is switched off and the engine is directly coupled to the propeller shaft.

The Ferro Alloy Controversy.

Supreme Court to Rule on Question of Duty.

WASHINGTON, D. C., March 14, 1905.—The Secretary of the Treasury will ask the Attorney General to apply for a writ of certiorari to the United States Supreme Court in order to make a final test of the question as to the proper dutiable classification of ferrochrome, ferrotungsten, ferromolybdenum and ferrovanadium, alloys which have just been held by the United States Circuit Court of Appeals to be subject to duty at $4 per ton by assimiliation to ferromanganese, under paragraph 122 of the tariff act, but which the customs officials contend should be assessed at the rate of 20 per cent. ad valorem as unwrought metals under paragraph 183.

Special Considerations Involved.

In carrying this case to the highest court the Treasury Department is moved by two considerations of special importance. One is the fact that in the case of ferrochrome, for example, the Government would receive duties amounting to $50 per ton if assessed at the rate of 20 per cent. ad valorem as an unwrought metal instead of $4 as an unenumerated article similar to ferromanganese, while the other is the great interest taken in this controversy by certain domestic manufacturers who are now making several of these products by electrosmelting processes, and who claim that if importations are permitted on the basis of a duty of $4 per ton they will be obliged to suspend their operations.

In deciding these ferro alloys to be nonenumerated articles and by similitude dutiable at the same rate as ferromanganese the Circuit Court of Appeals enters into an interesting discussion of the metallurgical processes involved in their production and utilization. Assuming that all of the ferros in controversy are in essential particulars alike, the court bases its decision upon ferrochrome, as to which it says:

"It cannot be hammered or rolled or worked into any commercial article, and this is true of all of the ferros in controversy. . . . It is admitted on all hands that ferrochrome is not *eo nomine* enumerated in the tariff act of 1897. If therefore it be not covered by the general language of paragraph 183 as a 'metal unwrought,' it becomes a nonenumerated article, subject to the provisions of the similitude clause.

"A decision that ferrochrome is not a metal unwrought does not necessarily involve a decision that it is a manufactured article; it is enough if the collector's classification be erroneous. The ordinary meaning of 'wrought' is worked up, elaborated, worked into shape, labored, manufactured, not rough or crude. 'Unwrought' imparts the reverse of these conditions. To be more specific, 'unwrought metal' implies a metal which is capable of being wrought, and not a substance which is only fit to be thrown into the crucible to be melted up with other ingredients to produce an entirely different and distinct product."

Ferro Alloys Not Unwrought Metals.

Continuing, the court proceeds to analyze the expert testimony of certain witnesses in the case who declared that ferrochrome was never employed alone in metallurgy and was never wrought or manufactured into anything for practical use, a statement that will apply equally to the other ferro alloys. Taking up this question as to the kind of product that would come within the tariff definition of 'metal unwrought,' the court cites the case of aluminum in pig form:

"Having had occasion recently to examine the complicated process by which aluminum is produced, we are inclined to think no better example of unwrought metal can be given. And this unwrought aluminum is capable of being wrought into innumerable articles both useful and ornamental. In this particular the controversy is *sui generis*, and we do not feel justified in deciding upon the present record that a metallic substance which is only used in imparting certain qualities to steel and which is incapable of being wrought into any useful article is a 'metal unwrought.' We therefore find that the ferros in question are unenumerated articles and subject to the operation of the similitude clause.

"The question remains, Is ferrochrome similar to ferromanganese? This question has been passed upon by this court in United States *vs.* Dana (99 Fed. Rep., 433), and what is there said is applicable to the present case. The counsel for appellant have taken pains to point out numerous instances wherein the two articles differ, but it must be borne in mind that the statute does not require identity; if that were necessary the statute would have no *raison d'être*. It is enough if there be a substantial similitude in any one of the particulars mentioned—material, quality, texture or use (Arthur *vs.* Fox, 108 U. S., 125). Ferrochrome and ferromanganese look alike, even the experts are unable to tell them apart, and they are similar in quality and in use, notwithstanding the fact that they produce different results and are not applied at the same stage of the process of making steel."

The Department takes sharp issue with the conclusions of the court stated in the closing paragraph quoted above, contending that the difference in the functions of ferrochrome and ferromanganese in metallurgy is so great that they cannot possibly be said to be "similar in quality and in use." Following the argument submitted by the Willson Aluminum Company of New York, filed on behalf of the Government in this case, it is pointed out that ferromanganese is added to the steel while in process of manufacture because of the chemical action it has on various component elements of steel. As a result of such chemical action physical benefits are apparent in the final product, but they are not due to the physical presence of ferromanganese in the final steel, but solely and entirely to its chemical influence on those component elements. Ferrochrome is used as a physical addition to the finished steel for the physical benefits which it confers thereon. Physical and chemical action are totally distinct phenomena, and the fact that the results of such processes sometimes bear a resemblance to each other is not a ground for classing the two as similar. In fact, in their very nature they are totally different from each other, they accomplish their objects by different modes of use, affect the finished products differently and accomplish final results which are not at all similar. Such being the case the Department contends it cannot be claimed that ferrochrome and ferromanganese are similar, "either in material, quality, texture or the use to which they may be applied."

Result of Recent Decision.

Attention is drawn in this connection to the following statement of the American manufacturers of ferrochrome as to the result that will follow if the decision of the Circuit Court of Appeals is permitted to stand:

"Two products, ferrosilicon and ferromanganese, varying in value from $28 per ton in the former to $50 in the latter, are taxed at the rate of $4 per ton. Ferrochrome, a product whose market value is at least $250 a ton, is assessed and dutiable at the same rate. Thus we have two products, one worth about one-eighth and the other about one-fifth of the value of ferrochrome, taxed at exactly the same rate. It is true that discrepancies in tariff schedules are usually matters for Congressional action. At the same time, when it can be shown that such discrepancies need not exist if a logical interpretation be put upon the laws it becomes at once the duty of the courts or the executive departments to so apply the laws as to avoid discrepancies or injustice.

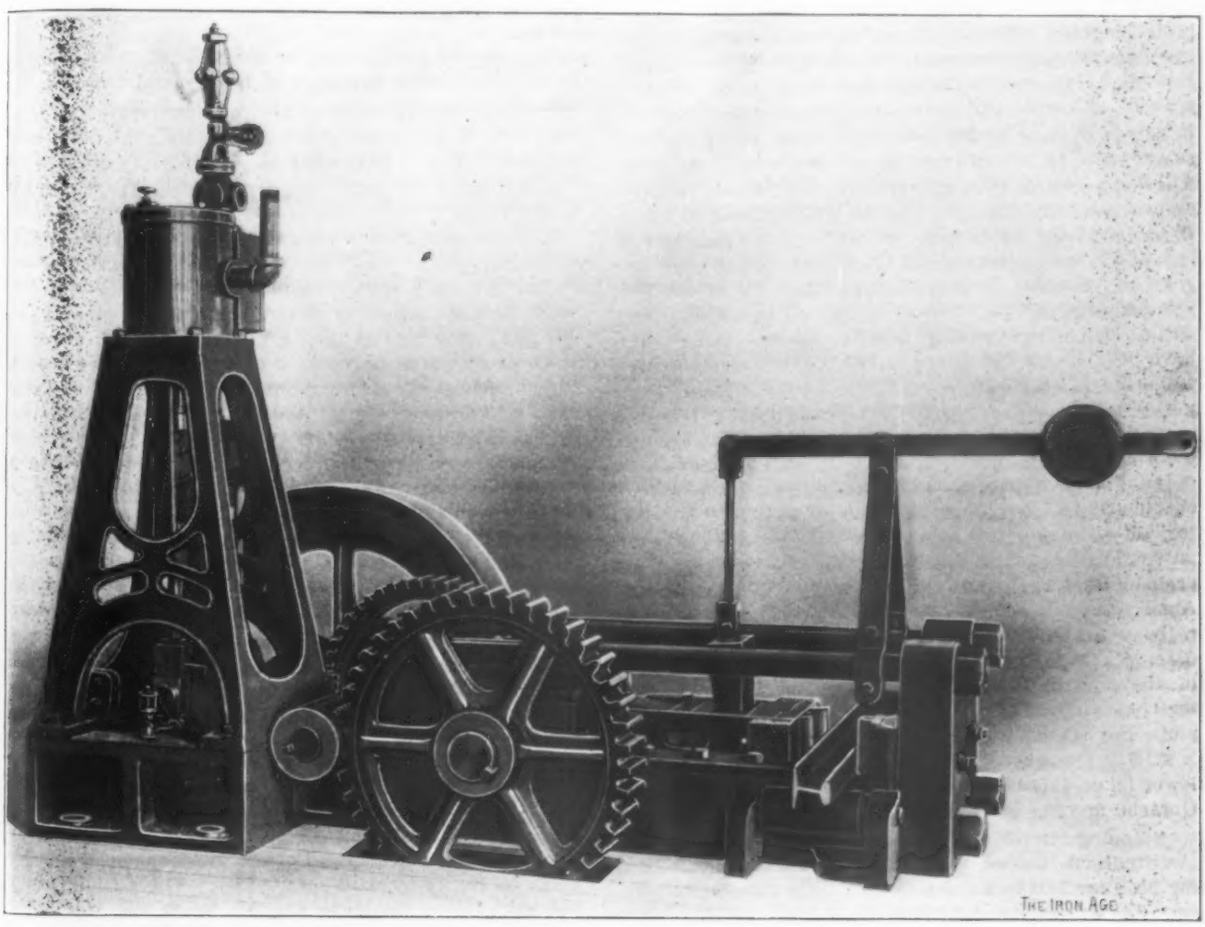
"Obviously a duty of $4 per ton on an article worth at least $250 per ton when of the best quality affords no protection whatever to the American labor and capital engaged in its production. A plant for the production of high grade ferrochrome represents necessarily the investment of a large amount of capital. Two electrical horse-power will not produce more than a ton of ferrochrome per year, and the labor employed must be of the highest class and consequently expensive. The industry is, moreover, a new one, which under the policy of this Government should receive every protection to which it is entitled under the tariff laws."

In view of the important issues involved the final outcome of this controversy will be awaited with much interest.

W. L. C.

The Curry Steel Rail Breaker.

The accompanying engraving shows a machine for breaking steel rails, designed and built by Curry & Co., Danville, Pa. For its class of work the machine is claimed to have several advantages over a shear. It will break about twice as many rails as can be sheared in a given time and leaves the ends of the rail straight instead of shattered. The pieces can be broken accurately in given lengths or weights so as to govern the length of bars rolled from the pieces. If a rail may be divided evenly into the multiples desired there will be no scrap at all where the breaker is used, and if it will not divide evenly there will be but one piece of scrap at the end, as there are no small pieces such as break off while shearing. The expensive knives required for shearing are eliminated, there being no knives in the breaker. This machine will break any size tee rail up to and including 100 pounds per foot and any shape of rail up to 6 inches wide, by adjusting the base pivot plate.



A Machine for Breaking Steel Rails, Built by Curry & Co., Danville, Pa.

The breaker is 9 feet long by 3 feet 4 inches wide, weighs 15,000 pounds, and can be driven by electricity, belt, or a steam engine which is mounted on the bed plate and connected direct, as shown in the illustration. The gearing runs continuously, but the breaking operation takes place only when the counterweighted wedge is dropped between the plunger and plunger head, causing it to move forward and break the piece between the pivots. The plunger head continues to move forward and backward as long as the wedge remains inserted, but as soon as the wedge is withdrawn the plunger head is drawn backward by the plunger to the back center and remains stationary until the wedge is again inserted. The plunger makes 12 to 15 strokes per minute, which allows the operator to insert the wedge instantly when the rail is in position to be broken, or withdraw it when the rail has been broken and is to be removed. If an exact length is not required the plunger may be run continuously, the wedge being allowed to remain inserted.

The breaker is neat in design and strong and efficient for the work it has to perform. The housing bed, which receives almost the entire strain, is ample for the work and is reinforced by four 3-inch bolts, which take the breaking strain, thus insuring great strength. The gear wheels, pinions and pivot plates are steel castings. The journals are Babbitt lined and the plunger head box, which acts as the plunger guide, is of brass. One of these machines is in successful operation at the works of the Danville Structural Tubing Company, Danville, Pa.

The Reading Iron Company, Reading, Pa., has purchased the plant of the Danville Rolling Mill Company, at Danville, Pa., and will operate the puddle mill in conjunction with its Montour rolling mills, situated in the same city. The company has also decided to build an additional puddle mill at Reading adjoining its Keystone blast furnaces. The new mill will contain 20 puddling furnaces, which with the newly acquired property at Danville will give the company an additional supply of nearly 40,000 tons of muck bar per year. This additional supply of iron has become necessary because of the increasing demand for wrought iron pipe and the largely increased capacity of the tube works.

The Ludlow-Saylor Wire Company, St. Louis, Mo., has favored us with photographs showing highly artistic grille work made entirely from wrought iron. The sections for the particular piece of work to which these photographs relate comprised 81 lineal feet. Elaborate leaf designs form a portion of the grille, which are the result of highly skilled hand work. The original of these designs was secured from Guadalajara, Mexico, where it was used in sections of the railing made for the Banco de Londres y Mexico. The company is building up an extensive foreign trade in ornamental designs in metal work in addition to its large domestic business.

Lake Iron Ore Matters.

A Record Breaking Output Indicated.

DULUTH, MINN., March 11, 1905.—As the season advances and the beginning of navigation approaches the preparations for a record breaking ore output increase. Mine after mine that has been idle for more or less time gets into shape for production, and as fast as men are found they are set at work. More and more stripping contracts are let upon the Mesaba range, and more and more do the developments indicate that the year will see the total ore moved up to 30,000,000 gross tons.

During the week a very large proportion of the ore sold for the season has been chartered for lower lake delivery, and several important independent shipping offices are filled up to the close of navigation with all ore they care to take on. Probably at least 10,000,000 tons have been chartered. The United States Steel Corporation has been making charters greatly in excess of its tonnage for last year. Its own combined season capacity will this year be in excess of 11,000,000 gross tons; how much in excess is to be determined only by the date of initial shipments. Twenty trips of the Steel Corporation's fleet will move more than 10,000,000 tons, and it is practically assured that there will be at least one or two trips extra. If the Steel Corporation moves up to 18,000,000 tons, as is claimed to be the possibility, it has not yet covered anywhere near its requirements, so far as can be learned. The big independent fleets, like those of Gilchrist, Hawgoods, Mitchell, Tomlinson, Smith, Wolvin and others, have been taking ore charters for some days. The rate from the head of the lake and Ashland to Lake Erie ports is fixed at 75 cents a ton; from Marquette at 5 cents under, and from Escanaba at 15 cents under, which is an advance of 5 cents all around over last year.

It is a fact that a greater amount of ore has been chartered already than in any similar period in the history of the lake trade, and this not only actually but proportionately with the tonnage to be moved. It is probable that navigation will be in full swing soon after April 1, and looking to this end the head of the lake railways are to commence hauling ore to dock on that date. There is not more than 3 miles of ice at the head of the lake, none at Two Harbors and very little in the channels leading from the upper lake to Sault Canal, while the Sault River is not liable to cause trouble after April 1. Though there is some talk of heavy ice in the lower lakes, this is not really a serious matter except on Ontario, and the ore ships do not go there.

Shipping interests have closed contracts with all their multitudinous unions, the Cooks' and the Seamen's having been the last to come into line. It is possible to compute the average cost of running a lake vessel in comparison with last year. The difference will be slight, so slight indeed that it is scarcely perceptible.

Figures show how constantly the fleets of the lakes are gaining in size of their units and to what enormous proportions some of these ships have now attained. The fleet owned by G. A. Tomlinson of Duluth and his associates has now an average capacity of 8149 net tons for each of its 13 ships, that of H. A. Hawgood of 7110 net tons and that of the Smiths of 6500. The United States Steel Corporation, with its great fleet of 100 ships, has an average capacity for but 5752 net tons, but the corporation has included in its list of vessels 60 with an average of 7067 tons, and therein it exceeds all others on the lakes.

Sale of the Jackson Mine.

The old Jackson property, discovered in 1844 and first opened as a mine in 1848, has been sold in its entirety to the Cleveland Cliffs Iron Company. The transfer of the entire stock issue of the Jackson Iron Company was made last week. Most of the Jackson's production of late years has been a low grade non-Bessemer taken from the old rock piles, for the mine itself has not been worked much for the past five seasons. The original Jackson mine was permitted to fill with water as far back as 1898, and what ore has since come out of it has been from open cuts. The company opened its South Jackson about that time and produced a little manganiferous ore, running about 56 per cent. combined iron and manganese. There is a concentrating works, probably of little value to-day, and about 20,000 acres of lands on which the Cleveland Cliffs Company hopes to find ores in quantity. Near the east end of Teal Lake, where the company has lands, are excellent indications of iron, and it is possible that vigorous exploration may determine something of importance, though the Jackson company has done a good deal of this sort of work during past years. The total production of the Jackson mine, from 1848 to the close of 1903, has been 3,774,892 gross tons. There are large bodies of low grade ores still in the mines, and the time will come, sooner perhaps than has been anticipated, when these ores will be of value. The price paid for Jackson stock was quite low, and in very great contrast to the years when the mine was paying annually an enormous dividend.

In several particulars the Jackson is most notable. It was the original discovery of iron by white men in the Lake Superior region, was the first to be formed as a mining company, first to be worked and first from whose ores iron was made on the shores of the lake. The excellence of its product early served to establish the reputation of Lake Superior ores, and the magnitude of its shipments and the wonderful financial success of the company directed an attention to this region that resulted in widening and fixing the interest of the mining world. It stimulated exploration, the investment of capital, immigration and the settlement of the shores of Lake Superior and was the first potent factor in the building of the Sault canal. The first regular shipments of Jackson ore began the year after the Sault was completed, 1856, and that year amounted to 5000 tons. Until 1864 the Jackson, Cleveland and Lake Superior were the only shippers. Geologically the formation at Jackson is of great irregularity, and the occurrence of ore deposits was largely a matter of conjecture, and their continuance when found was only determined by the workings. In 1881 an affiliated company built a concentrating works for crushing the rock of waste dumps and that obtained from the jasper walls of the mine and separating and saving the ore contained therein. This works did duty a few years but has long been idle.

On Friday of this week the suit of the Cleveland Cliffs Iron Company against the Breitung Estate was argued before the United States Supreme Court. The case involves the right of the Cleveland Cliffs Company, under a lease for 99 years made to one of its predecessors by the Breitungs about 48 years ago, to mine and to smelt, within Marquette County, ores taken from the lands of the latter without royalty. The company has lost the case in the lower courts. There are 1400 acres involved, and the Mary Charlotte and Breitung Hematite mines are on the land. Both these were discovered by the Cleveland Cliffs when exploring under the terms of the lease and prior to the intervention by the Breitung heirs.

Notes.

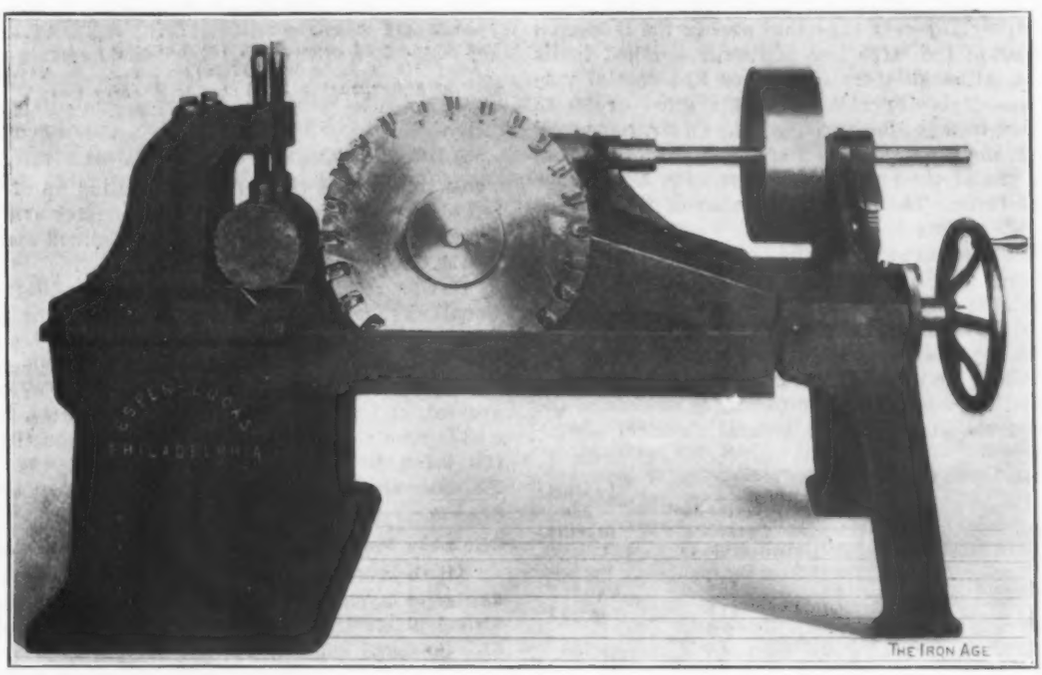
Welsh mine, of the Commonwealth Iron Company, Menominee range, belonging to Oglebay, Norton & Co., is to be operated this year. The shaft, which is 300 feet deep, is bottomed in a narrow lens of ore and extensive developments are to be carried forward. The output will be small. An exploration plant that has been at this mine will be placed about two miles away at Buckeye, where a shaft will be sunk. The company's Badger mine is to be abandoned, as exhausted. It has been a shipper since 1881, and has produced 2,466,566 tons.

The old Breen mine, at Waucedah, idle many years, is to be reopened and will produce some ore this season. It is owned by the Mineral Mining Company, whose stock is held by officers of the Pewabic Iron Company. At Tobin mine the old one-compartment shaft is being divided into three, a 10-foot slice coming off one end of it. This slice was cut down and timbered 43 feet last week, a record that can hardly be improved upon. Pickands, Mather & Co.'s Caspian has resumed operations. Its water is to be blown and pumped and a very general overhaul will be made of the machinery equipment. D. E. W.

An Espen-Lucas New Cold Saw.

A new design of its No. 3 cold saw cutting off machine is being placed on the market by the Espen-Lucas Machine Company, Philadelphia, Pa. In general design the machine is similar to the regular No. 3 tool, but the work of driving high speed saws, for which it is intended, has required the redesigning of a number of the parts. The castings in the body of the machine are heavier throughout, and in some parts iron castings are replaced by steel. The design of the gearing has been changed, so that in the new tool the former feeds of the machine are doubled and by a special device the feed, which is variable, can be changed while the saw is in operation.

In practical operation the machine has proved capable of driving a modern high speed steel inserted tooth saw, with one of which it is shown equipped in the illustration, to the limit of the saw's capacity. This machine has cut 6-inch steel bars 0.25 carbon in six minutes, and even better results have been shown in cutting higher carbon steel.



The New No. 3 Cold Saw Cutting Off Machine, Built by the Espen-Lucas Machine Company, Philadelphia.

The two clamps with which the machine is equipped for holding the work are made heavier than usual to afford a secure holding of the work for high speed cutting. These machines are furnished for belt or direct motor drive, and can with slight changes be adapted to saw rails, steel castings, forgings, &c., as well as bars.

Water Supply by Compressed Air.

The water supply of Los Angeles, Cal., has in the past been received by gravity, only a few higher parts of the city being supplied by pumping into the mains. The growth of the city, however, has made an additional supply necessary, and a pumping plant is to be installed in the southwestern part of the city, near Slauson Junction, where wells have been bored to water bearing strata lying 60 to 200 feet below the surface. As these wells are too deep to be operated by pumping engines located on the surface, and as it would be commercially impracticable to pump them by deep well pumps with long plunger rods, and, again, very costly to excavate pumping stations underground near the water level, it has been decided to use compressed air, which offers the further advantage that one central plant may operate all the wells scattered over a half-mile stretch.

The system adopted is the air lift, in which compressed air is forced to the bottom of the well through one pipe, where it discharges under the mouth of another reaching to the top of the well and emptying into the reservoir. The bubbles of air issuing from the first pipe enter the mouth of the second carrying the water between them. The water within the second pipe being mixed with air weighs less than that in an equal cross section of the well exterior to the pipe. The pressure of the water in the well therefore is greater and forces the mixture of air and water in the pipe to rise constantly, and as the bubbles of air are continually supplied at the bottom this process goes on continuously, the mixture of air and water discharging at the top of the well in a practically constant stream. The air as it rises toward the top expands, thereby returning the work which was expended in its compression, and as in expansion the temperature of air is greatly reduced it serves at the same time to cool the water.

In the present case the 12 wells will discharge into a common reservoir, from which the water will be forced by a pumping engine into the city water mains. The water in the wells at present stands about 60 feet below the surface, but, as has been found in irrigation work in California, the ground level of subterranean water supplies is apt to be lowered considerably by continuous pumping and the compressor has therefore been designed to pump, if necessary, from a much lower level, being guaranteed to deliver 2000 cubic feet of air per minute against a pressure of 100 pounds. The contract for the compressor was awarded to the Baker Iron Works, Los Angeles, who are local agents of the Laidlaw-Dunn-Gordon Company, New York City. The compressor is of the two-stage type, in which the air is partly compressed in a large cylinder, passed through a cooler and further compressed in a high pressure cylinder. The steam engine driving the compressor and forming a part of it is also compounded.

Philadelphia manufacturers of railroad equipment and supplies are preparing exhibits for the appliance exposition to be held in connection with the International Railway Congress in Washington in May. Space has been reserved by more than a dozen firms of Philadelphia. Chief among these exhibitors are the Baldwin Locomotive Works, J. G. Brill & Co., Cambria Steel Company, Pennsylvania Steel Company, Standard Steel Company, Hale & Kilburn Mfg. Company, Philip S. Justice & Co., John Lucas & Co. and William Wharton, Jr., & Co., Incorporated.

A Canadian Dellwik-Fleischer Water Gas Plant.*

BY ERNST A. SJÖSTEDT, SAULT STE. MARIE, ONT.

It should be a matter of some pride and interest to Canadian metallurgists to know that one of the most important improvements of the age in gas making—the Dellwik-Fleischer water gas process—was early adopted by a Canadian firm; but as this plant still remains the only one of its kind in all America, in spite of its great merits and economic adaptability for many and diverse purposes, I gladly take this opportunity of giving it the indorsement and publicity which it deserves, with the hope of advancing the general adoption of the same.

In looking through the voluminous literature on water gas of only a few years ago and making deductions therefrom, we are certain to arrive at the same opinion as expressed by some of the foremost gas engineers in America and of manufacturers of well-known gas producers when they describe water gas as "a gas which never can play any very important part in the industrial field, owing to the large loss of energy entailed in its production, although there are places and special purposes where it is desirable, even at a great excess in cost per unit over producer gas." This, I fear, represents fairly well the general opinion of many should-be users of water gas at the present time, but such a view has long since become obsolete, and it is about time for us to wake up to this fact and to the realization of the great possibilities in store for the Dellwik water gas, and the economy and convenience possessed by water gas when produced by the Dellwik principle.

Compared with producer gas (Siemens', Dawson's, Mond's & Taylor's), water gas is practically all combustible, while the producer gas generally contains about 60 per cent. incombustible constituents, as seen from the following table, showing their general chemical composition:

Composition by Volume.

	Water gas theoretically. Per cent.	Water gas practical average. Per cent.	Producer gas practical average. Per cent.
Carbon monoxide	50	40.0	30.0 to 27
Hydrogen	50	51.5	3.0 to 18
Marsh gas	..	0.5	4
Carbon dioxide	..	5.0	4.5 to 5
Nitrogen	..	3.0	63.5 to 46
Total combustibles	100	92.0	33.0 to 49
Available heat per cubic foot gas	.322 B. T. U.		139-157 B. T. U.

The Dellwik Water Gas.

The difference between the old (Lowe) water gas and the Dellwik gas is not one of chemical composition nor one of application, but rests solely on the simple and economical manner in which it is produced. Water gas making by the old system was an intermittent process in which the gas was made by blowing up the fuel bed of the producer with a light blast of air to a high state of incandescence (and in some cases utilizing the resulting lean producer gas), then shutting off the air and forcing steam through the fire, thereby disassociating the steam into the elements of O and H, the former combining with C of the coal and the latter being liberated:

$$C + H_2O = CO + 2H$$

The result of such a procedure is the consumption of about 73 per cent. of the fuel in the production of the required heat for disassociating the steam, leaving only 27 per cent. of the fuel for water gas generation three-quarters of the time being devoted to the heating up stage and only one-quarter of the time to water gas production.

By the Dellwik-Fleischer system this has all been reversed. The water gas generation by this method produces no carbon monoxide during the period of heating, but brings about a complete combustion of the carbon, with the formation of waste gases only (CO_2 and N), and the time of heating up occupies less than 20 per cent., while fuel consumption is consequently also greatly altered in favor of the Dellwik-Fleischer method, the total yield of the water gas per pound of coke by the old process being only 15 to 20 cubic feet (30,000 to 40,000 cubic feet per ton coke), whereas by the new system 35 to 45 cubic feet are obtained per pound of coke (70,000 to 90,000 cubic feet per ton).

In order to explain how these results (which by the German Patent Office and many eminent investigators at first were pronounced impossible) still are attainable, the following figures are presented: Under the supposition that in one case the C is burnt to CO, and in the other to CO_2 (in each case with the theoretically proper quantity of air) we find that by the old process

	B. T. U.
1 mol. C—12 pounds—burnt with 16 pounds O to CO, develops (12 × 4,450 =)	53,400
The escaping 28 pounds CO (at 1,300° F.) carry away (28 × 1,300 × 0.248 =)	9,027
and the accompanying 52.9 pounds N carry away (52.9 × 1,300 × 0.244 =)	16,780
	25,807
Leaving available heat units in coke bed	27,593

By the Dellwik-Fleischer process

1 mol. C—12 pounds—burnt with 32 pounds O to CO_2, develops (12 × 14,544 =)	174,528
The escaping 44 pounds CO_2 (at 1,800° F.) carry away (44 × 1,800 × 0.217 =)	17,186
and the accompanying 105.8 pounds N carry away (105.8 × 1,800 × 0.244 =)	46,467
	63,653
Leaving available heat units in coke bed	110,875

From this we see that after the heating up of the coke bed about four times as much heat remains available for the production of water gas by the Dellwik-Fleischer as by the old process.

Having reached incandescence in this direct and rational way, the fuel is now subjected to the action of the steam, the supply of which is carefully regulated so that the oxidation of C to CO_2 by steam, which always takes place to a certain extent in the old process, is here avoided, and the result is, as above indicated, that with a fair coke the usual practice is the production of 70,000 cubic feet of gas per ton coke by the Dellwik-Fleischer system, as against 34,000 cubic feet by the old process.

The Lake Superior Power Company Water Gas Plant.

All these facts came to our notice a few years ago, and after having investigated the subject carefully and visited plants in active operation in Germany and Sweden, the Lake Superior Power Company decided to avail itself of the new invention and to erect a water gas plant based on this principle, in connection with its process for desulphurizing the pyrrhotite used in the manufacture of SO_2 gas for the production of a bisulphite liquor for their sulphite mill and for the manufacture of liquid sulphurous anhydride.*

This plant consists of two No. 4 generators, complete with scrubbers, blowing engine, boiler and gas holders, each generator having a capacity of producing about 20,000 cubic feet of water gas per hour, and the two operating will, when allowance is made for time lost in cleaning grates, &c., produce a total of 800,000 cubic feet of water gas per 24 hours. The *modus operandi* is as follows:

The coke is charged into the generator until a bed of 3 to 4 feet depth is formed, when to the ignited coke a strong air blast from the blowing engine is admitted through a blast pipe under the grate, the top valve being open. Under full combustion of the carbon and the formation of CO_2, which escapes through the chimney, an incandescent heat of the coke bed is obtained in less than two minutes, when by means of an ingenious interlocking system of valves, operated by a ratchet wheel, the blast is cut off, the gas valve is opened, the top valve is closed and steam is admitted alternately from the top and the bottom of the producer, so as to maintain uniform heat and prolong the life of the brick work lining. During 8 to 10 minutes, or until the test flame shows indication of a weak gas, the steam is thus admitted and the water gas process continued, after which the valve system is reversed, the steam valve shut off, the water gas valve closed, the top valve opened, a coke

* Paper prepared for the Montreal meeting, March, 1905, of the Canadian Mining Institute.

* See article, "Acid Making from Pyrrhotite," *Jour.* Can. Min. Inst., Vol. 7.

charge is admitted and the blast again turned off for heating up and preparing the coke bed for another water gas period. The water gas thus produced enters through a gas main, either direct or by way of an intermediate steam superheater, to a scrubber, where it meets a water spray from sprinklers and is thereby cleansed from dust and sulphur vapors. From the scrubbers the now dry and purified gas passes through gas outlets to the gas holders, which in our case are two in number, each holding 20,000 cubic feet of gas. From here the weight of the holder forces the gas through a system of pipes leading to the places of consumption.

From first to last our water gas plant has given us great satisfaction, no trouble having been encountered nor any accident having occurred to detract from its general usefulness. Having improved our roasters, so as to make an auxiliary fuel unnecessary, the plant has been used very intermittently; but we have found it economy and a great convenience to operate the same, even at times when needing gas only at the rate of a few hundred thousand cubic feet per month for use in our laboratory and for welding purposes in the machine shop. The simplicity of the plant and the ease with which it can be handled make it a simple matter to start up and shut down at leisure, running it for a few hours while filling our gas holders, and after the gas has gradually been consumed again starting the producer and refilling the gas holders. This requires only a couple of hours' time and the labor of two men. The cost of the gas, with coke at $6 per ton, varies from 15 cents (when running the two producers continuously) to 50 cents per 100,000 cubic feet (when running the plant intermittently, as above referred to). Counting on the production of 70,000 cubic feet of water gas per ton coke, a day's running expenses will be made up of the following items:

Expenditure.

Coke, 11.5 tons at $6	$69
Steam	20
Labor, 4 men at $2.50	10
Superintendence, power, water, light, depreciation and repairs	21

Product.

800,000 cubic feet water gas at 15 cents	$120

Applications of the Dellwik Water Gas.

From what has already been said we find that the yield of water gas by the Dellwik invention is more than double that of the old process, and the consumption of coke in the heating up stage is reduced by one-half. The quantity of fuel required for producing the necessary amount of steam for power and gas making is from 15 to 20 per cent. of that used in the generator, consequently we obtain from the Dellwik water gas the remarkable net yield of 75 to 80 per cent. of the heating power of the fuel. For this reason and owing to the high calorific value and high temperature of combustion with air without preheating or regeneration (3500 to 4000 degrees F.), the value of this gas for many and various purposes is self evident. Speaking generally, its advantage consists of a saving in fuel, time, labor and of an improvement in the quality of the work produced, especially where a high and even temperature is required. For cheapness, quickness and excellence of work it offers particular advantages for welding, brazing, soldering, forging, tempering, annealing and melting of metals, in the manufacture of open hearth and crucible steel, in the manufacture of pipes, steam boilers, forged car wheels, in glass blowing, china and pottery firing, in burning lime, cement and plaster, in calcining, drying, heating and evaporation, for fuel and lighting purposes, and for motive power in engines for diverse purposes.

Several of the above applications deserve special mention, and I will now briefly point out the more important ones, using for my authority Inventor Carl Dellwik, London, and Chief Engineer Hugo Dicke of the Water-Gas Syndicate, Frankfort-on-the-Main.

METALLURGICAL OPERATIONS.

Welding.—In welding iron plates for boilers the consumption of gas is about 750 cubic feet (corresponding to about 19 pounds of coke) per foot welded joint, of which 40 feet of welded joint of ⅜ to ½ inch iron plate can be finished per shift of 10 hours. In welding gas and water pipes, boiler flues, gas cylinders, poles for electric tramways and arc lamps, the use of water gas will increase the output from three to four times over that obtained by coke firing, and requires only about one-half the number of laborers. In making wrought car wheels the welding of one wheel star ordinarily requires 220 pounds of coal and 132 pounds of coke at a total fuel expense of about 28 cents, whereas by water gas seven wheels per hour are turned out with 8800 cubic feet of gas at a cost for fuel of about 15 cents per wheel. In specially constructed furnaces for the purposes of chain welding the cost of fuel is reduced by at least 40 to 60 per cent., while the clean heat of the gas and the consequent absence of dust and slag from the welding surface result in a better and more reliable weld.

Brazing and Soldering.—For this purpose water gas is particularly advantageous, owing to its applicable source of heating, consequently it is being used in the manufacture of bicycles and tubes of thin metal, for gas cylinders for railroad car lighting, self lighting buoys, for compressed gas, &c.; also in the manufacture of ornaments and jewelry. On account of its purity it has also proved especially suitable for lead burning, which ordinarily is done with hydrogen gas, the production of which costs about 20 times as much.

Forging and Heating.—When objects of similar size and shape are to be made water gas is particularly well adapted, but even for ordinary forges in machine shops, &c., the Dellwik gas has been applied with great success, having been found to be of great advantage to the blacksmith because the iron is exposed to view during the process of heating, besides giving a clean fire and a constant supply of heat, easily controlled by the simple turn of a valve. Iron bars 2⅜ inches square are welded together with water gas in 4 minutes, 1⅝ inches square in 3 minutes, 1 x 1¾ inches square in 2 minutes and 1 to ¾ inch round in about 1½ minutes. For the purpose of heating rivets very convenient and effective heating furnaces for water gas have been devised and have proved to offer even greater advantages than the blacksmith forges.

Tempering.—The application of water gas for the manufacture of knives, scissors, swords, saws, tools, &c., was made before the Dellwik system of water gas making was invented. Experience shows that not only is the heat equally distributed but the bars come out all of one even color and temperature, and three times more work is turned out now at half the price, as compared with tempering by coal fire. This gas is also used in the manufacture and tempering of watch springs, needles, &c.

Annealing.—Special stress is laid on the advantage of water gas in the annealing of jackets of ordnance and of plates for the outer sheeting of torpedoes and in the tempering and annealing of rifle barrels.

Steel Manufacture.—The advantage of mixing water gas with producer gas in an open hearth furnace of ordinary construction has long been appreciated at an English steel works, where the charge is smelted with a mixed gas, after which the water gas is shut off and the process continued with unmixed producer gas until an hour before tapping, when water gas is again added so as to make the steel as hot and liquid as possible. The result of adding 1800 cubic feet of water gas per ton of steel is an increase in production of about 26 per cent. Used unmixed in open hearth furnaces water gas should also be highly advantageous, as the heating effect of the water gas is about 39 per cent. higher than that of the producer gas; and when we further consider that in the production of producer gas about 70 per cent. of heat value of the fuel is consumed and that in making water gas 85 per cent. of the actual heat value of the coke is obtained, it is evident that the total heating effect of pure water gas is $(85 \div 70 \times 1.39 =)$ 1.68 times as great as that of producer gas; consequently there seems to be no doubt of the importance to steel makers in adopting an exclusive Dellwik water gas firing.

OTHER MECHANICAL APPLICATIONS.

Glass Making.—For the purpose of glass melting and glass blowing water gas is used to great advantage in

Bohemia and Stockholm, resulting in a considerable reduction in the cost of fuel. At an incandescent lamp factory making from 5000 to 7000 lamps per day, and where city coal gas was previously used, the introduction of the Dellwik gas reduced the cost of fuel about 80 per cent. in soldering the glass bulbs and in heating the lamp during the vacuum pumping; and for the carbonization of filaments, which previously was done by means of petroleum at a cost of $4.50 per barrel, a corresponding amount of work was afterward performed for $1.65 expended in water gas, besides making a saving of one man per shift. In smelting enamels in the Perrot furnace Dellwik water gas accomplishes an equal amount of work as coal gas at about one-eighth the cost of fuel.

Boiling, Evaporating and Distilling.—Comparative tests have shown that under exactly similar conditions 1000 cubic feet of water gas will evaporate the same amount of liquor as 450 cubic feet of coal gas, and as the average cost of this gas amounts to about $1 per 1000 cubic feet the use of the Dellwik water gas reduces the cost to about one-third.

Power.—Water gas is eminently adapted for driving gas engines on account of its smokeless combustibles. In small motors where 35 cubic feet of coal gas are required per horse-power, 70 cubic feet of water gas suffice, and in a large engine averaging about 23 cubic feet of coal gas per horse-power hour, 45 cubic feet of water gas are required. A gas engine designed for illuminating gas works equally well with water gas, and the cheapness of the Dellwik gas makes this gas the most economical source of power. As compared with the producer gas the cleanliness and high calorific power of the water gas constitute important advantages. The following table will show the economical results obtained (in England) using different gases in a 250 horse-power gas engine (with coal gas at 70 cents per 1000 cubic feet, boiler coal at $3 per ton, gas coal at $3.25 per ton, coke and anthracite at $4 per ton and wages at 8 cents per hour):

	Cost of fuel. Cent.	Total cost. Cents.
Coal gas (23 cubic feet) per horse-power hour	0.660	1.61
Steam (3.3 pounds coal) per horse-power hour	0.426	0.57
Dellwik water gas (45 cubic feet) per horse-power hour	0.248	0.36

AS USED FOR ILLUMINATING AND HEATING.

Illumination.—On account of its high flame temperature water gas lends itself admirably for incandescent gaslight, and is used for such purposes in industrial establishments, as well as in some towns where non-carbureted Dellwik gas is distributed. Incandescent lamps for water gas are of simpler construction than those for coal gas lamps, but should be provided with a stronger mantle, owing to the high temperature of the water gas flame. In those places where no gas works as yet exist it would be advisable to make pure water gas, both owing to the cheapness of the plant (one-half to one-quarter of the cost of a coal gas plant) and the price of the pure water gas (about one-third that of coal gas). The capacity of existing coal gas works can be largely increased at a comparatively small cost by the erection of an auxiliary water gas plant for the purpose of mixing water gas with coal gas, especially in places where a good market for coke does not exist, as by converting the entire output of coke into water gas the capacity of the combined plant would be four times that of the original coal gas works.

One pound of coal yields 4.65 cubic feet of coal gas and about 0.65 pound of coke. If we from this take the coke required for firing the retort (about 15 per cent.) there still remains 0.5 pound of coke to be converted into (16 cubic feet) water gas. Thus we will receive 20.65 cubic feet mixed gas per pound of coal. With such a mixture the Welsbach lamp, consuming 7 cubic feet per hour, will produce 100 Heifner (equals 88 English) candles, equal to 14.3 H. candles per cubic foot, or 293 H. candles per pound of coal; while the coal gas will consume 3.8 cubic feet per hour and produce 60 H. candles, yielding 72 H. candles per pound of coal. Consequently we obtain from the mixed gas about four times as much incandescent light by distilling one-quarter of the coal and converting the resulting coke into water gas. To carburet this mixed gas with oil is also easily accomplished.

In the following table is given the approximate cost (in England) of the different lights used (with retort gas at 55 cents per 1000 cubic feet, water gas at 20 cents and carbureted water gas at 56 cents):

	Average candle power.	Cost per hour.	Cost per 1,000 candle-power hour.
Petroleum	40	0.814	20.4
Retort gas, ordinary burners	16	0.280	17.5
Retort gas, Argand burners	30	0.504	16.4
Retort gas, Welsbach burners	50	0.256	5.12
Pure water gas, Welsbach burners	75	0.144	1.92
Carbureted water gas, ordinary burners	22	0.280	12.72
Electric light, glow lamp burners	16	0.400	25

Heating.—Compared with the heating of dwellings by means of coal gas the Dellwik water gas has the following advantages. *a*, The cost of a water gas plant is only one-third that of a coal gas plant of equal capacity; *b*, labor in operating a water gas plant is only one-quarter to one-fifth that of a coal gas plant; *c*, the relative value of the water gas for heating purposes is to retort gas as 0.588 is to 1—that is, 1000 cubic feet of water gas corresponds to 588 cubic feet of coal gas. Below is shown the cost (in Germany) of heating with coal gas at 75 cents per 1000 cubic feet, with water gas at 25 cents per 1000 cubic feet and with coal at $3.75 per ton:

Coal Gas (550 B. T. U. per cubic foot): 100 pounds of coal, yielding 465 cubic feet gas, with a useful effect in the stove of 90 per cent., will deliver (465 × 550 × 0.9 =) 255,000 B. T. U. The cost of this gas is (465 × 0.00075 =) 34.9 cents.

Water Gas (275 B. T. U. per cubic foot): To produce 255,000 B. T. U. from water gas, allowing the useful effect in the stove of 90 per cent. [255,000 ÷ (275 × 0.9) =], 1030 cubic feet would be required, costing (1030 × 0.00025 =) 25.7 cents.

Coal (12,600 B. T. U. per pound): With the usual stove efficiency of 16 per cent. it would require [255,000 ÷ (12,600 × 0.16) =] 126 pounds of coal to develop 255,000 B. T. U., or a fuel expense (126 × 375 ÷2000 =) 23.6 cents.

Thus we see that the Dellwik water gas for heating purposes is about one-third cheaper than coal gas and only a little dearer than coal, besides possessing the advantages of freedom from soot and smoke, which again would mean a salutary, refreshing air that soon would be appreciated in any community in the event of pure water gas being introduced for heating and cooking purposes.

The general utility of the Dellwik water gas for all purposes of heat and power has now been briefly indicated, and the conclusion we arrive at is that in large industrial establishments the erection of a central Dellwik water gas plant would prove of the greatest general utility and possess many advantages over any other gaseous or solid fuel, not only as regards cleanliness and convenience but in ultimate economy as well.

Car Wheel Foundry Practice.

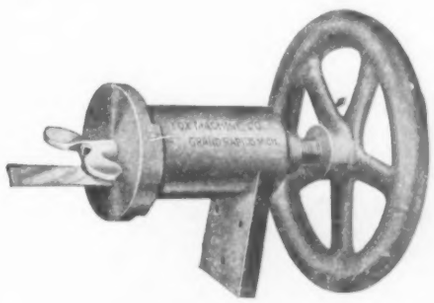
In response to the criticism of G. K. Hooper of the new wheel foundry of the Pennsylvania Railroad Company at South Altoona, Pa., which was printed in the last issue of *The Iron Age*, E. McLean, superintendent of the foundry, writes as follows:

It is reasonable to suppose that the Pennsylvania Railroad before this foundry was designed had a very thorough investigation made by competent persons of all modern methods and appliances pertaining to this branch of foundry work. In fact, before the building was started visits were made to all the prominent wheel foundries of the United States, and among them the only foundry in existence that is operated on the principles advocated by Mr. Hooper—namely, the Central Car Wheel foundry of Pittsburgh. The practices at this foundry were given particular attention without finding anything in their methods that was considered at all desirable.

The Fox Wax Fillet Press.

For rapidly turning out wax fillets for patterns, or wax core vents, the Fox Machine Company, Grand Rapids, Mich., is now putting on the market the No. 1 fillet press herewith illustrated. Fillets or core vents of different sizes may be made by turning a circular die plate so as to bring the hole of desired size in front of the opening of the cylinder cap. This plate is located inside of the cap casting and may be turned by means of the thumb keys shown. When the cylinder is nearly empty the cap may be easily removed and a fresh supply of wax poured in. The press is supported when in use by clamping its supporting arm in a vise. It is regularly furnished with one die plate for three sizes of core vents, 1-16, 7-64 and 11-64 inch diameters respectively, and for fillets ranging from No. 2 fillet, ⅛ inch wide, up to No. 8 fillet, ½ inch wide. Extra die plates with openings for any size fillet or core vent may be had on special order.

In the operation of the press the comparatively small wheel shown in the engraving furnishes ample leverage



The Fox Wax Press for Making Pattern Fillets and Core Vents.

except when the wax becomes unusually hard as a result of low temperature. While a larger driving wheel might be furnished, the maker recommends it as preferable that the machine be held over a gas flame or otherwise heated when the wax becomes cold, as in that event a better class of work is secured than if an attempt is made to force core vents or fillets from wax so hard as to require greater leverage than that afforded by the regular wheel.

To Minimize Conflagration Hazard.

The National Board of Fire Underwriters, composed of 120 of the leading fire insurance companies doing business in the United States, has appointed a committee charged with the duty of organizing an engineering department, composed of men standing high in their profession, to investigate the conditions of fire protective measures, stating facts as to those existing and making recommendations for improvements that would minimize the sweeping fire or conflagration hazard, especially in the congested or heavy value districts of important cities. A staff of engineers has been organized and four parties are now in the field, each collecting data and making tests in some different city. This work is being carried on by men who have had experience in civil, mechanical, structural, hydraulic and electrical engineering. The chief engineer, E. G. Hopson, is a well-known hydraulic engineer, who was for a number of years in charge of the Clinton office of the Metropolitan Water Board, Boston. Capt. Greely S. Curtis is the engineer in charge of investigations of fire departments and their auxiliaries. The entire work of the committee is under the direct supervision of Herbert Wilmerding, the secretary, with office at 135 William street, New York. Mr. Wilmerding has for many years been a close student of the relation between fire insurance and municipal departments, especially in relation to building construction and fire hazards. The United States Government has detailed two army engineers to investigate and review the reports of each city. The statement is made that the National Board of Fire Underwriters has no desire to dictate but intends rather to put facts before those interested, hoping and believing that the result may be beneficial to all concerned.

Customs Decisions.

Two important decisions defining the exact meaning of the statute of limitations in the law of June 22, 1874, which provides that liquidation of an entry shall be final and conclusive, in the absence of fraud, after one year from the "date of entry," were handed down March 10. One was by the Board of United States General Appraisers, and written by General Appraiser Eugene G. Hay, and the other was written by Judge Wheeler of the United States Circuit Court. Judge Wheeler's ruling, while governing a somewhat different state of facts, took substantially the same view as Mr. Hay regarding the technical meaning of the word "entry" in the tariff law.

The transaction which came before Mr. Hay for adjudication was initiated October 10, 1902, by the filing by the importer, F. C. Cassell of New York, of the first paper, commonly called the "entry." Estimated duties were then paid and a bond given for the payment of such duties as should be found to be due on liquidation. Liquidation took place January 16, 1903, and duty was finally paid January 23, 1903. Later, new facts as to the merchandise came to the knowledge of the collector and reliquidation took place October 14, 1903. The importer protested against this reliquidation, claiming that more than a year had elapsed from the date of filing the first paper, or "entry," October 10, 1902. Mr. Hay rules that in interpreting the law the narrow meaning of covering only the first paper cannot be applied to the word "entry," but that in the meaning of the law the term is broad enough to cover the entire transaction from the filing of the first paper to the final payment of duties.

The case decided by Judge Wheeler will, if affirmed by the United States Circuit Court of Appeals and the Supreme Court, cost the Government about $5,000,000, which it will have to pay to the American Sugar Refining Company and others in refund of duties paid on raw sugars imported from Cuba in 1903. The President was authorized by Congress to grant a reduction of 20 per cent. on all merchandise imported from Cuba within ten days prior to the ratification by this Government of the reciprocity treaty with Cuba. This ratification took place March 31, 1904. The importations which formed the subject of the suit before Judge Wheeler were made between July 14 and September 9, 1903. The importers, in anticipation of the proclamation, protested against paying the full duty, and their protest was before the Board of United States General Appraisers when the proclamation was issued. Judge Wheeler rules that the importation is not complete until the case has been finally disposed of by the Government officials, and that the importers are therefore entitled to their refunds.

Several decisions affecting metal importations and written by General Appraiser Fischer were handed down by the Board of United States General Appraisers March 10. Mr. Fischer overrules a protest by Thomas Prosser & Sons of New York against the classification as boiler plates, value over 4 cents a pound, at 25 per cent. of certain iron plates 30 feet long, 12 inches wide and ⅝ inch thick. The importers claimed the merchandise to be dutiable as bar iron at 6-10 cent a pound. Mr. Fischer also overrules protests by S. Blumenthal & Co., H. S. Oppenheim, A. J. Myers, the New York Diamond Cutting Company and Robert H. Reid & Co. against the classification as manufactures of metal at 45 per cent. of certain cast iron disks, parts of diamond cutting or polishing machinery. Claims for various lower rates of duty as castings were made for them, but Mr. Fischer finds that they had been machined and finished after having been taken from the casting mold, and that they had therefore been advanced beyond the condition of castings. Mr. Fischer also overrules a protest by James W. Phyfe & Co. of New York against the classification as antimony at ¾ cent a pound of merchandise described as antimony metal in pigs. Free entry was claimed for it, either as a crude mineral or as antimony ore. Both claims were denied by Mr. Fischer.

The Monitor Duplex Steam Pump.

A new line of steam pumps, characterized by a decidedly novel valve arrangement, has lately been placed on the market by the Snider-Hughes Company, Cleveland, Ohio. Among the claims for the pump, which is known as the Monitor duplex, that of simplicity seems admirably borne out, as the steam valves are operated directly by the steam pistons and the entire mechanism consists of but six parts, as compared with some 23, exclusive of bolts, nuts and pins, in the old style duplex pump. By virtue of its construction the removing of the cylinder heads and other parts for repairing is greatly facilitated and protection from grit and injurious influences is afforded, greatly enhancing its durability. The pumps are made in patterns suited to the usual classes of service, such as boiler feeding, fire service and general water supply.

The illustration, Fig. 1, shows the general appearance of the pump and a transparent view of one of the steam cylinders, which contain the most novel features of the pump. The mechanism of the steam ends consists of two steam pistons, two steam valves and two guides, one being located in each cylinder. The steam pistons removed from one cylinder with the valves and guides in place are shown in Fig. 2, and the parts of the valves and guides are shown by themselves in Fig. 3. The operation of these parts is particularly interesting. The two steam cylinders are placed side by side, each having steam and exhaust ports at each end. The ports at the ends of one cylinder communicate with the ports placed horizontally and centrally in the adjacent wall of the other cylinder. The arrangement of these ports is shown in Fig. 4, and by it the steam valve in one cylinder controls the steam supply in the other.

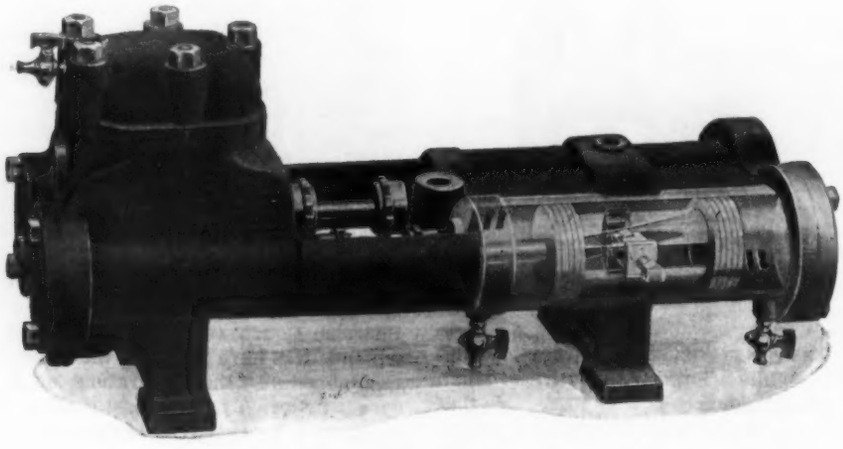


Fig. 1.—The Monitor Duplex Steam Pump, Showing One of the Steam Cylinders in Phantom.—Built by the Snider-Hughes Company, Cleveland, Ohio.

The steam pistons are of the double head type, the heads being connected by a hollow cylindrical body. The pistons are so located that the two heads lie on opposite sides of the central ports at all times, and the spaces between them serve as a steam chest. The steam enters these spaces through a steam pipe cast across the top of the two cylinders. The steam pistons are prevented from rolling in the cylinders by the guides which work in straight horizontal slots in the bodies connecting the piston heads. These guides are bolted to the outer walls of the steam cylinders, as shown in Fig. 1.

The inner ends of the guides are forked so as to engage the stems of the steam valves, as shown at the left in Fig. 3. This prevents any movement of the valves endways. The spiral slots in the bodies connecting the two heads of the steam pistons are placed face to face next to the adjacent cylinder walls and over the central ports. The steam valve faces are turned to fit the cylinder walls over the central ports. The steam valve stems work in the spiral slots, as shown in Fig. 2.

The operation may be best described by referring to Fig. 1. For convenience the nearest cylinder will be designated as A and the other cylinder B. As the steam piston A moves to the right, the piston being prevented from rolling and the steam valve from moving endways, the valve is rolled downward by the spiral slot. This uncovers the upper steam port and steam is admitted to the right end of cylinder B. Simultaneously the lower exhaust port is uncovered, making connection through the D-shaped ports of the steam valve from the left end of cylinder B to the main exhaust. This causes the piston in cylinder B to move to the left. On the reverse stroke in cylinder A the valve is rolled upward, admitting steam to the left end and opening the exhaust to the right end of cylinder B and the piston in cylinder B moves to the right. In the same manner the piston valve in cylinder B controls the steam supply to cylinder A. The motion of the steam pistons is transmitted to the water pistons by piston rods in the usual manner. The water cylinders are of standard approved design.

It will be noticed that there are no outside working parts in the Monitor duplex pump, and that all parts have large bearings, and being in the direct path of the steam are constantly oiled from the main lubricator. The motion of the steam valves is continuous throughout the length of the stroke, allowing the steam piston to come to rest gradually at the end of each stroke, thus giving the water valves time to close quietly and without shock before the return stroke. This prolongs the life of the water valves and insures smooth working at high speeds.

Pumps for boiler feeding and general service where the working pressure does not exceed 150 pounds are regularly fitted with brass lined water cylinders, brass lined seats and pins, rubber valves and iron fibrous packed water pistons. They can also be supplied all iron fitted for the pumping of ammonia or all brass fitted for brine. These pumps are made in ten sizes, ranging in capacity from 20 to 325 gallons per minute.

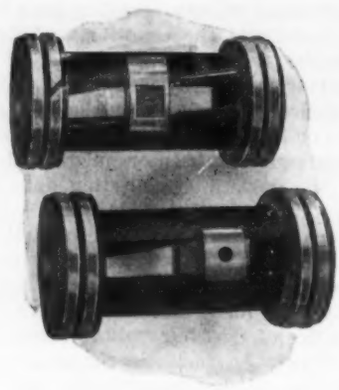


Fig. 2.—The Steam Pistons with the Valves and Guides in Position.

The high speed at which the pumps are capable of working makes them peculiarly well adapted to fire service. For such purposes the Monitor duplex is furnished in all regular sizes up to and including 16-inch steam cylinders. These pumps are made extra heavy, with large passages for the water, and are suitable for 200 pounds pressure.

Another class of pumps are automatic and are furnished in connection with receivers for such work as the draining of steam coils, radiators, steam jackets, returning water of condensation direct to the boiler, &c. These are made in the same sizes as the boiler feed pumps. Another grade of pump is made for low pressure service where large quantities are handled against a pressure which does not exceed 60 pounds, and an outside packed pump is made for work involving the handling of gritty water.

New Boiler Inspection Laws.

WASHINGTON, D. C., March 14, 1905.—The Department of Commerce and Labor is about to promulgate a series of new laws with regard to the inspection of steam vessels and dealing especially with the requirements regarding boilers, which were passed by Congress in the closing hours of the recent session.

No less than a dozen measures were drafted by the Department and introduced in both houses early in February. It was impossible at so late a stage of the session, however, to secure the passage of all these bills and several of the most important failed to receive consideration and will be brought forward again in the next Congress. Chief among the measures that failed to pass was the bill, heretofore described in these columns, authorizing the appointment of an expert commission to draft a general code of specifications for the construction of all steam vessels subject to the navigation laws of the United States. This bill will be strongly urged in the next Congress.

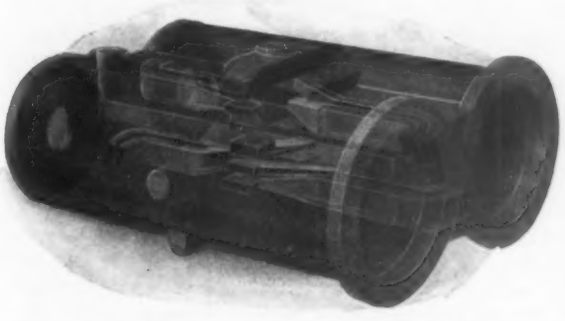


Fig. 4.—Phantom View of the Cylinder Casting with Parts Removed, Showing the Steam Passages.

Boilers and Appurtenances.

The principal measure of interest to boiler manufacturers which became a law before adjournment embodies a series of amended requirements with regard to the construction of boilers and their appurtenances. This feature of the new law, which takes the place of section 4418 R. S., provides that inspectors shall require the following specifications to be met in all steam vessels before they shall be used:

That the boilers are well made, of good and suitable material; that the openings for the passage of water and steam, respectively, and all pipes and tubes exposed to heat, are of proper dimensions and free from obstructions; that the spaces between and around the flues are sufficient; that flues, boilers, furnaces, safety valves, fusible plugs, low water indicators, feed water apparatus, gauge cocks, steam gauges, water and steam pipes connecting boilers, means of prevention of sparks and flames from fire doors, low water gauges, means of removing mud and sediment from boilers, and all other such machinery and appurtenances thereof, are of such construction, shape, condition, arrangement and material that the same may be safely employed in the service proposed without peril to life; and the local inspectors shall satisfy themselves by thorough examination that said requirements of law and regulations in regard thereto have been fully complied with. All boilers used on steam vessels and constructed of iron or steel plates, inspected under the provisions of section 4430, shall be subjected to a hydrostatic test, in the ratio of 150 pounds to the square inch to 100 pounds to the square inch of the working steam power allowed. No boiler or flue pipe, nor any of the connections therewith shall be approved which is made, in whole or in part, of bad material, or is unsafe in its form or dangerous from defective workmanship, age, use or other cause.

Regulations to Be More Elastic.

The code of laws and regulations with regard to the construction of boilers and the inspection of steam vessels is rendered much more elastic than heretofore by a provision enacted by Congress authorizing amendments to be made in the standing regulations without the necessity of convening the entire Board of Supervising Inspectors. Thus, if boiler manufacturers, through the development of the art or for any other reason, should decide that a change in the regulations is desirable, such modification can be made without summoning the board in extra session or waiting for the regular annual meeting. This provision of the new law is as follows:

Provided, that the Secretary of Commerce and Labor may at any time call in session, after reasonable public notice, a meeting of an executive committee, to be composed of the Supervising Inspector-General and any two supervising inspectors, which committee, with the approval of the said Secretary, shall have power to alter, amend, add to or repeal any of the rules and regulations made, with the approval of the Secretary of Commerce and Labor, by the Board of Supervising Inspectors, either by virtue of this section or under any power granted by this title, or any amendments thereof, such alteration, amendment, addition or repeal, when approved by the said Secretary, to have the force of law, and to continue in effect until 30 days after the adjournment of the next meeting of the Board of Supervising Inspectors. The foregoing powers of such executive committee, acting with the said Secretary, shall also extend to the approval of the instruments, machines and equipments referred to in section 4491 of this title.

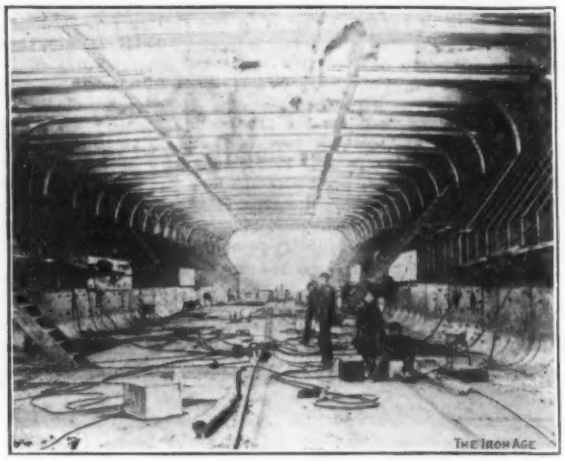
This provision is regarded as of special importance in view of the fact that numerous changes in existing regulations will be made in the near future. Should the innovations prove unsatisfactory, it will be practicable for the Secretary of Commerce and Labor to summon to Washington two inspectors from nearby districts and make the desired amendments without delay. W. L. C.

Fig. 3.—One of the Valves and Guides Assembled and Taken Down.

The annual meeting of the Second District of the National Metal Trades Association was held at the Bay State House, Worcester, March 11, with a representative attendance. The following District Committee was elected: Chairman, H. D. Beach, formerly of the Pacific Iron Works, Bridgeport, Conn.; F. H. Strong, Eaton, Cole & Burnham Company, Bridgeport, Conn.; George T. Brown, Brown Cotton Gin Company, New London, Conn.; Charles E. Hildreth, P. Blaisdell & Co., Worcester, Mass.; A. W. Whitcomb, Whitcomb Mfg. Company, Worcester, Mass. Various routine business was transacted.

The 10,000-Ton Lake Vessels.

Ore and other bulk freight shippers and vesselmen everywhere are watching with interest the evolution of the big lake ship as it is shown by the construction of three series of 10,000-ton vessels, one set each for the United States Steel Corporation, George A. Tomlinson and A. B. Wolvin. These ships present many new and



View of the Interior of One of the 10,000-Ton Vessels Under Construction for the United States Steel Corporation.

widely different features from any that have ever been put afloat, and there is much discussion as to the best of the various types.

Ideas foremost in the minds of the builders were the same—that is, the ships should be able to utilize to the utmost the new and rapid unloading devices evolved by the Wellman-Seaver-Morgan Company and the firm of Hoover & Mason in their Hulett automatic and their Mason unloaders, and they should be of the largest size that builders are willing to undertake at present. It is curious to note the various ways in which these results are sought to be attained and the varying interpretations of mechanical principles that have been brought out.

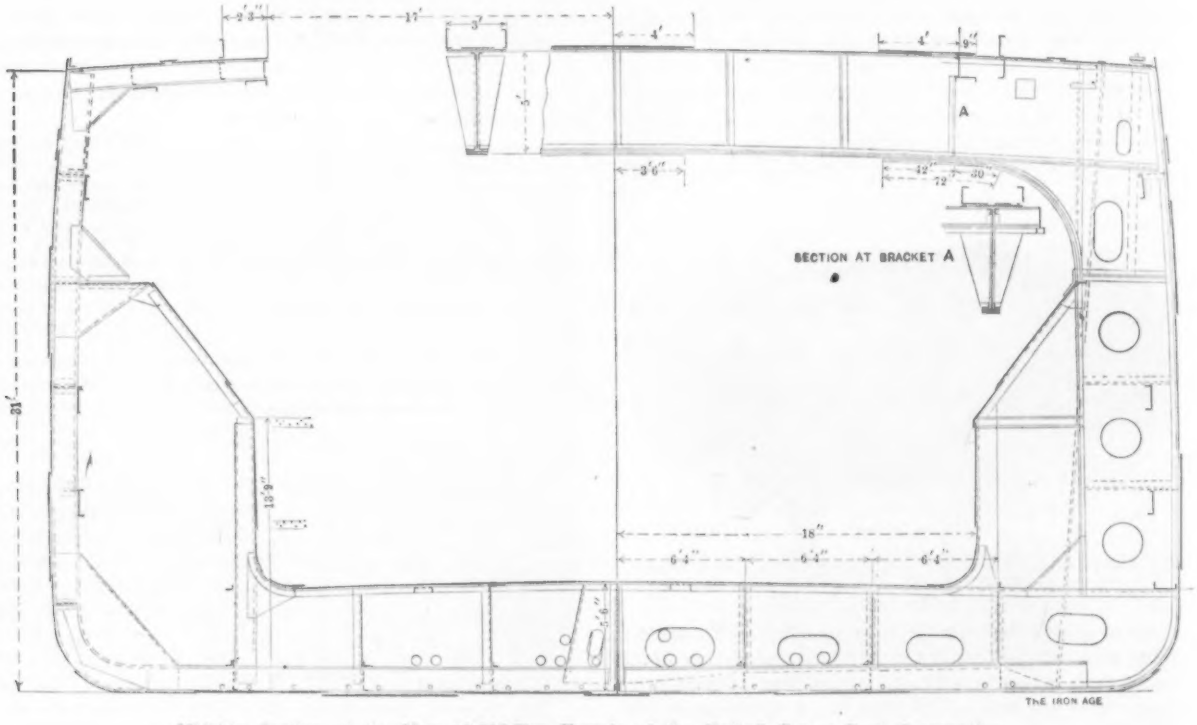
The New Steel Corporation Ships.

The United States Steel Corporation has under way four ships, duplicates, all of them 569 feet long over all, 549 feet keel, 56 feet beam and 31 feet deep. They are 9 feet longer than the Wolvin, which has marked the extreme in ship size until now. They are designed for a cargo of 10,000 gross tons on 18 feet draft. The decks of these ships are pierced by 33 cargo hatches, each 9 feet wide, across the deck, and spaced 12 feet centers; so there is but 3 feet between the openings. This makes the deck negligible as a constructive factor for stability. A ship is a great oblong box, and when one of its four principal dimensions is unable to maintain its share of the stresses the strength of the whole must be made up elsewhere. In order to utilize to the utmost the new unloading devices it is necessary that there be the minimum of cross beams and stanchions between decks, and these have been eliminated entirely in these vessels. The strength lost in the decks is made up by extra heavy construction below, by heavier plates at the decks and by the use of girders across the ship between the hatches. The construction of the cargo hold is a departure from anything now on the lakes. The Wolvin was a longitudinal hopper, whereas in these ships the cargo hold descends in a straight line from the deck to within 9 feet of the tank top, when an inner hold, or hopper, is constructed, placed 9 feet in from the sides of the vessel and 5 feet above the bottom. Between the outer and inner skins and up the sides of the inner hold is room for 8500 tons of water ballast, making the ships navigable in any weather though running without cargo. The accompanying illustrations bring out the leading features in their design and construction.

These vessels will be fitted with the latest appliances for moving hatch covers, and two men can take off or replace the entire 33 in 20 minutes. They will have triple expansion engines with steam from Scotch boilers fitted with induced draft and capable of delivering steam at 170 pounds, and in auxiliary equipment they will be more complete than any vessels now afloat.

The New Tomlinson Ships.

The new Tomlinson ships differ materially from those above described, or from anything else that has been attempted. Four of them are 524 feet over all, 54 feet beam and 30 feet deep. One of these will be built with a series of cross hoppers in its cargo hold, each hopper being designed to permit most rapid loading from a single hatch by the unloading machine, and it is expected that they will reduce the unloading time materially. These hoppers extend athwartship, from side to side, and add materially to the cross strength of the vessel.

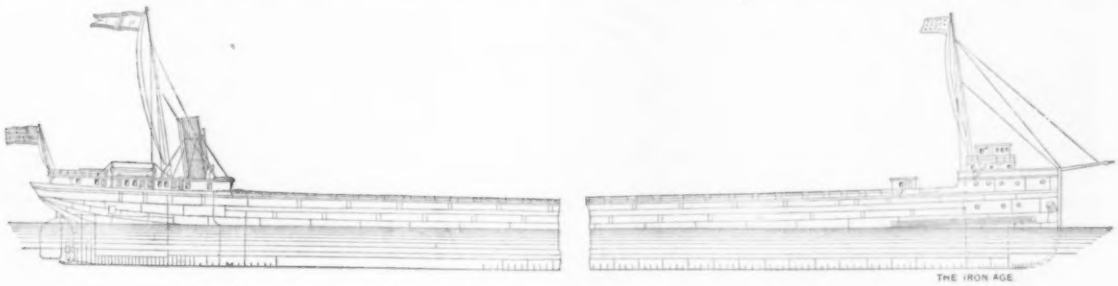


Midship Section of the New 10,000-Ton Vessels of the United States Steel Corporation.

There are no double sides to this vessel, but the water ballast is carried in the customary space between the two bottom skins and in the hopper, thus giving nearly as big a capacity as that of the Corporation vessels.

The Wolvin New Vessel.

Mr. Wolvin is building another ship for the Acme Steamship Company, similar to the A. B. Wolvin. In this vessel the clear space of the cargo hold was first emphasized, and there was an arch construction of the deck girders, running athwartship, fore to aft. This gave plenty of room for the unloading machine to swing above the cargo, and the hopper of the inner hold, in which the



Profile of the New 10,000-Ton Vessels of the United States Steel Corporation.

cargo is carried, permitted the machine to take up all the cargo without the assistance of an ore shoveler.

The Large Lake Tonnage Now Under Construction.

Twenty-two freight ships are now under way on the lakes, capable of carrying 214,000 gross tons per trip; this is within 15,000 tons of as much as the 48 freighters that were under way at lake yards two years ago. In addition to these seven large steel ships have been cut in two and pulled apart and are to be lengthened 72 feet —three hatches—increasing their capacity very materially.

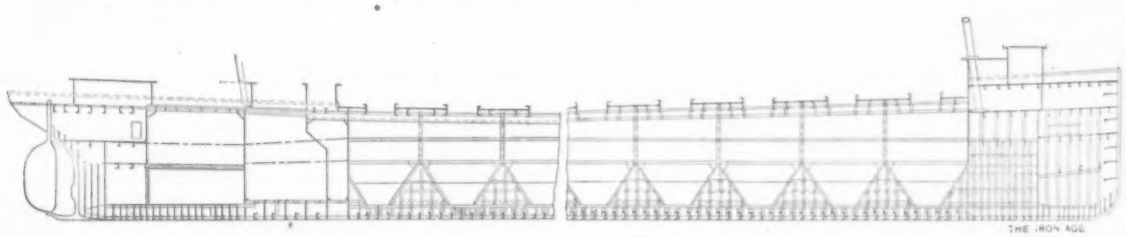
The change in type of large freighters combined with the size of the units of the fleet under way marks almost an epoch in lake shipbuilding. Never before have freight ships on the lakes been cut in two for lengthening and enlargement, and the work is of no little moment. That it will be followed another year by a still larger number is unquestioned, providing the rebuilt ships give a good account of themselves. In the lengthening process the vessels are first cut in two near either end, then pulled apart by steam or air the exact distance, and then again connected and strengthened by heavier top plates running well forward and aft. The keel plates are also made very heavy. The pulling apart of a ship for rebuilding is a delicate job, for the two parts must remain in perfect alignment after the work is done and must fit to a fraction of an inch. The part to be moved is built into a cradle on greased ways, and at the point where it is desired the cradle shall stop after pulling a heavy block is bolted on. A piece of steel is then bolted to the foot of the stern and to this ropes are attached, which lead to pulleys and to a windlass, where the power is applied. At the yard of the Superior Shipbuilding Company a few days ago the large steamer Victory was pulled apart and the operation was completed in 17 minutes, which is record time for this sort of work.

D. E. W.

The Republic Iron & Steel Company has commenced active work on its new blast furnace at Haselton, Ohio. J. W. Deetrick, general superintendent of the Valley works of the company, at Youngstown, is in charge of the work of erection.

Costs as An Element in Technical Education.

As stated in the letter from Henry R. Towne, printed in *The Iron Age* last week, the principles of shop management and industrial accounting have been taught by lecture in several of the American technical schools for some years, so far as instruction can be given in the lecture room. But the Worcester Polytechnic Institute course is essentially a practical one and is believed to be the first of its kind. There is a great difference between knowledge learned from lectures and that obtained in actual contact with a subject in its practical adaptation. Lectures on boiler testing cannot teach what the making of actual tests will teach. A student will learn more of machine shop methods by going into the shop and working at the lathe, milling machine and planer, under competent instruction, than if he is taught only the theory of the shop in the lecture room. As was pointed out in an editorial in *The Iron Age* of March 2, with the Worcester idea the students actually take charge of the cost system and work out future costs on machines which will go into the machinery markets of the world. The young men go into the shops and by actual test and with careful study work out improved methods of production. The theory of these and other branches of shop management may be taught by lecture, but the idea of the mechanical engineering branch of the Worcester Polytechnic is to give the student careful training, under expert supervision, in actual commercial shop management, the argument being that this method produces excellent results in the way of mental discipline, as well as giving a more practical and useful insight into a very important branch of industrial engineering.



Longitudinal Section of the New Tomlinson Vessels, 524 Feet Long.

Some of the mills and other industrial plants in the Pittsburgh district are running short handed on account of not being able to get enough common labor. Recently a representative of the Wabash Railroad was in Pittsburgh trying to secure labor to work on a division of the road being built near Cumberland, Md. He wanted upward of 2000 men to work on this contract, but left Pittsburgh with less than 50, although prepared to guarantee steady employment for six months at $1.75 per day.

The Jones & Adams Company, Chicago, doing a large wholesale coal trade in that city and at the head of the lakes, with extensive docks on Lake Superior and an important retail trade at Minneapolis and St. Paul, has been absorbed by the Pittsburgh Coal Company. By this acquisition the Pittsburgh Coal Company now controls all the coal dockage facilities on Lake Superior except those of the anthracite companies, the Boston Coal, Dock & Wharf Company and the Northwestern Fuel Company, thereby vastly strengthening its position in the upper lake field.

The McDonald Blast Furnace Charging Apparatus.

A patent was recently granted to Thomas McDonald of Youngstown, Ohio, for a new furnace charging apparatus, in which the deflector ring for distributing the charge is movable vertically. It has been found that a

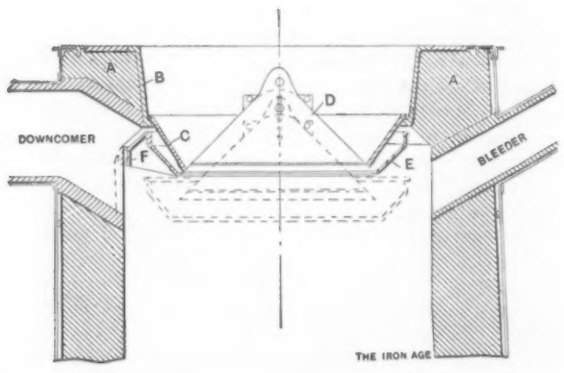


Fig. 1.—Vertical Section of a Blast Furnace Top Provided with the McDonald Charging Apparatus.

better distribution of the material and a more uniform working of the furnace can be obtained if the deflector is raised out of action for part of the charge and lowered into operative position for the balance of the charge. In the usual form of distributer the rings are held in a fixed relation to the bell when it is in its lowered position,

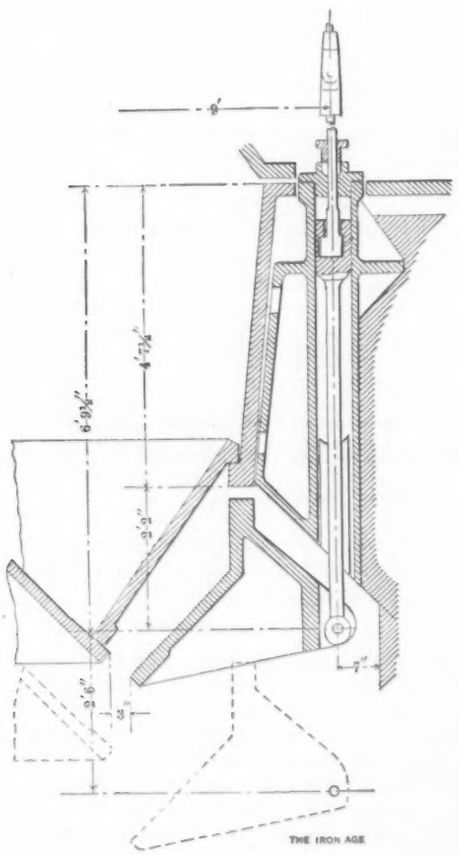
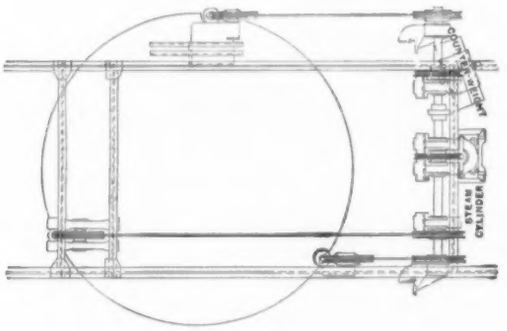


Fig. 2.—Sectional Details Showing One of the Lifting Rods.

so that the distributing ring acts upon the dropping charge in the same manner at all times. With the new device the charge may be varied to suit the condition of the furnace, throwing all of the material to the outside or to the inside or a part to the outside and a part to the inside. It is recommended that two charges be dropped into the furnace with the deflector in its upper position, these being caused to go to the outside of the furnace, forming an annular ridge shaped heap around the outer portion of the charge. Then by lowering the deflector a third charge may be dropped into the central conical cavity left by the other two charges, and the result is a more nearly uniform distribution.

With the bell arrangement alone or with fixed or stationary deflectors the charge is always thrown in the same place, the fine material piling up close to the wall of the furnace, while the coarse or lumpy material rolls to the center. With Mesaba ores the furnace soon builds up on the walls and continuous slipping results. It was to overcome this condition that the inventor was led to devise this more flexible means of charging, so that changes in the condition of the furnace could be counteracted by changes in the manner of charging.

Fig. 1 herewith shows a vertical section of a blast furnace top provided with the new deflector. A is the wall of the top of a blast furnace having the usual in-



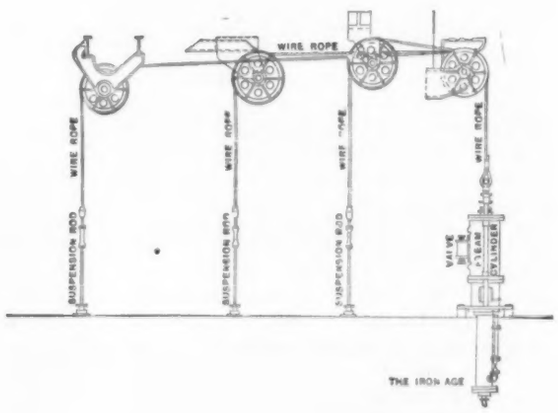


Fig. 3.—Plan and Elevation of the Mechanism for Operating the Deflector.

clined hopper B with the hopper extension C and closed bell D. E is the movable deflector ring shown in its raised and lowered positions. This ring is supported by three rods attached to lugs F placed equidistantly about the circumference of the ring. A detail of one of these lifter rods and a section through part of the charger is shown in Fig. 2; the solid lines show the bell and deflector in their upper positions and the dotted lines show them in their lower positions. It will be seen that the suspension rod is connected to an enlarged head on the lifter rod by means of a tee head, by the turning of which the parts may be detached. Suitable means in the form of locking blocks are provided to prevent the tee end of the rod from turning after it is in its locked position. The stems of the suspension rods are surrounded with stuffing boxes which prevent the escape of gases.

Fig. 3 gives a plan view and elevation of the mechanism and connections for raising and lowering the deflector ring through the suspension rods. Wire ropes connecting with the suspension rods pass over pulleys and connect with sheaves to a shaft which is rotated by a fourth sheave connected to a steam cylinder. The valve controlling this cylinder has rope connections leading to the operating floor, so that the valve may be shifted and the deflector moved to either of its positions from that point.

The Use of Waste Gases in Large Gas Engines.*

BY MAX ROTTER.

Practically all fuels which can be used for the generation of steam may to-day be used either to generate combustible gas suitable for gas engines or burned directly in the cylinders of such engines. When the gas is generated from solid fuels the economic advantage of the gas engine plant is reduced to the extent of the cost of such generation and its attendant thermal losses. When natural gas, coke oven gas or blast furnace gas is available, the advantage of gas over steam is enhanced, for then the steam boiler is not replaced by another, even though more efficient, apparatus in the form of a gas producer, but is entirely eliminated, with its attendant fire risks, labor and maintenance charges, and loss of at least 30 per cent. of the heat value of the fuel it consumes.

In this paper it is purposed to consider the direct use of waste gases from coke ovens and blast furnaces in large gas engines.

Coke Oven Gas.

The gas obtained in the process of coking coal in closed retorts or ovens is obviously very similar to the coal gas manufactured for illuminating purposes. An average analysis shows the following composition by volume: H_2, 39 per cent.; CH_4, 40 per cent.; C_mH_n, 5 per cent.; CO, 5 per cent.; CO_2, 3 per cent.; N, 7.5 per cent.; O, 0.5 per cent.

The gross heat value of this gas from and to 32 degrees F. and water is 679 British thermal units per cubic foot; its net heat value from and to 62 degrees F. and vapor is 560 British thermal units per cubic foot. The gas leaves the retorts at a high temperature, and, carrying a considerable burden of impurities, must be cooled and purified before it is in a condition fit for use in an engine cylinder. Its high hydrogen contents make it somewhat sensitive and violent; but with reasonably careful adjustment and operation it constitutes a good fuel for use in a gas engine.

In coking one long ton of average coking coal in a retort there are generated from 8000 to 10,000 cubic feet of gas, carrying from 60 to 100 pounds of tar and 10 to 25 pounds of ammonium sulphate. The tar and sulphate must be extracted and are marketable, their sale value more than covering the cost of their extraction; but generally the gas carries an excess of sulphur and always some dust, and the amount of these must be reduced to a minimum. Of the total volume of gas only about one-half is required for carrying on the coking process; a balance of 4000 to 5000 cubic feet remains available for other purposes, such as illumination or power generation. In other words, in the coking of 1 ton of coal there become available, and are only too frequently wasted, about 2,500,000 British thermal units, sufficient to develop in gas engines at least 205 effective horse-power hours. Thus for every 11 pounds of coal coked per hour 1 effective horse-power is available as a by-product.

Blast Furnace Gas.

The gas delivered at the top of a blast furnace, consisting of the products of combustion and partial combustion of the coke and the decomposed moisture and the volatile contents of the charge, shows an average volumetric composition as follows: H_2, 1.25 per cent.; CH_4, 0.25 per cent.; CO, 24.5 per cent.; CO_2, 12 per cent.; N, 62 per cent.

The gross heat value of this gas from and to 32 degrees F. and water is 92.5 British thermal units per cubic foot; its net heat value from and to 62 degrees F. and vapor is 86 British thermal units per cubic foot. This gas leaves the furnace top at a temperature of about 400 degrees F., and, carrying a considerable burden of dust and moisture, must be cooled, cleaned and dried before it is in a condition fit for use in an engine cylinder. The heat value of blast furnace gas lies chiefly in its CO, the proportion of H being very low; the gas is therefore neither sensitive nor violent, will safely permit a high compression, and as a result its ignition is sure and its efficiency high in spite of its leanness.

* Paper read before the Illinois Steel Works Scientific Club, Joliet, Ill., March 1.

For each ton of pig iron output the average blast furnace delivers about 10,500 pounds of gas at its top. In other words, the gas delivered by a blast furnace weighs 4.7 times as much as the pig iron it produces. The volume of such gas at 62 degrees F. and 30 inches of mercury, equivalent to a weight of 10,500 pounds, is 131,000 cubic feet. Thus, per ton of pig iron produced there are delivered by the furnace 11,266,000 net British thermal units.

A portion of this gas is utilized to heat the blast for the furnace to a temperature of about 1200 degrees F. Per ton output of pig iron about 145,000 cubic feet of free air at an atmospheric temperature of 62 degrees F. are required for blowing the furnace, to raise the temperature of which from 62 degrees to 1200 degrees F. there are consumed about 57,000 cubic feet of the gas, leaving 74,000 cubic feet available for other purposes. It has been demonstrated that the partial drying and cleaning of the gas before burning it in the stoves result not only in a reduction in the frequency with which the stoves must be cleaned and a reduced coke consumption, but also in an increase in the efficiency of the stoves, due to clean checker work and drier gas. Five per cent. of gas may in this way be readily saved and a surplus of 76,000 to 77,000 cubic feet, or, say, 6,580,000 British thermal units, per ton of pig iron safely figured upon. If burned under boilers to generate steam for high grade compound condensing engines consuming 16 pounds of steam per indicated horse-power hour, this surplus gas will develop 235 effective horse-power hours; but if used directly in the cylinders of gas engines it will develop 600 effective horse-power hours—over 2½ times as much power.

Taking as a concrete illustration a blast furnace plant having an output of 1200 tons of pig iron per 24 hours—that is, 50 tons of pig per hour—the surplus gas from this would develop continuously in a steam plant 11,750—say, 12,000—effective horse-power, scarcely enough to operate the furnace plant. But in a gas engine plant the same gas would develop continuously 30,000 effective horse-power, giving a surplus of 18,000 effective horse-power available for purposes outside the blast furnace plant. To isolated blast furnace plants not carrying on any industry except the production of pig iron, and not located near a market for light or power, the gas engine has therefore nothing to offer, but to blast furnace plants operated in direct conjunction with a rolling mill, for instance, the gas engine offers gratis the fuel necessary to develop 365 surplus horse-power hours for every ton of pig iron produced.

Treatment of Blast Furnace Gas.

As has been stated, the gas as it leaves the blast furnace top is hot, dirty and wet and must be cooled, cleaned and dried. The cooling in itself involves the drying, and the drying performs a large proportion of the cleaning. A typical mode of procedure is to pass the entire volume of gas through a dust catcher, the area of which is proportioned so that the gas travels at a very low velocity. In this dust catcher the major portion of the heavy dust settles out, and the gas temperature is reduced by radiation.

As a rule the gas passes directly from here to the stoves and boilers. If the gas mains are long and of ample diameter a further considerable quantity of dust settles out in them, and where water is scarce and space available a multiplication of dry dust catchers or long large mains with dust pockets affords an efficient means at low operating cost for all but the final drying and cleaning. But where an ample supply of cold water can be obtained the cooling and cleaning of the gas becomes simpler, and all the gas—whether for stoves, boilers or gas engines—should be washed by passing either through vertical tanks or horizontal pipes against fine sprays of water.

Such gas as is not to be subjected to further cleaning for use in gas engines should pass through water separators, to remove the entrained water, before reaching the stoves or boilers. The gas for gas engines must be still further cleaned and dried, and various means can be employed for this purpose, such as coke scrubbers with

steam jets, lattice work with water curtains, or centrifugals with water injection; these to be followed by filters consisting of layers of excelsior or sawdust, or followed by water separators. The use of a gas holder is always desirable, but its capacity per gas engine horsepower may be varied to suit the blast furnace plant. The greater the number of furnaces the smaller may be the gas holder.

A satisfactory gas cleaning installation in a plant where space will not permit more than a fractional cooling by direct radiation consists of vertical tanks set in water seal catch basins, followed by centrifugals with water injection. The vertical tanks are arranged in parallel, the gas entering each near its bottom, rising through a fine rain of cold water, which cools and washes it, and leaving it at the top. From these the gas passes to the centrifugals arranged two in series, after leaving which the gas flows through water separators into the gas holder. Such an installation capable of cleaning blast furnace gas sufficient to develop 5000 brake horsepower in gas engines occupies a ground space about 100 feet by 130 feet, including a 100,000 cubic-foot holder 62 feet in diameter and spare apparatus.

The power and water consumptions of gas cleaning plants vary between wide limits, and are much lower in winter than in summer. Under average conditions a plant such as described, in cleaning 1000 cubic feet of gas, consumes in summer 150 gallons of water and 1¼ horse-power, but in winter only 30 gallons of water and 1-3 horse-power.

The gas must be supplied to the gas engines at as low a temperature as possible; first, that the maximum weight of gas may be drawn into the cylinders, and, second, that a high compression may be carried without risk of preignitions. The gas must not carry more, at very most, than 0.025 grain of dust per cubic foot and should be under a pressure of 2 to 4 inches of water.

Large Gas Engines Now in Use.

At this date there are running and under construction large gas engines, to operate with waste gases, aggregating about 300,000 effective horse-power—almost all in Europe. In fact, but few steam engines are to-day being installed in European blast furnace plants.

The largest gas engine unit in actual operation using blast furnace gas of which we know is a horizontal, four cylinder, double acting Nürnberg gas engine at the Rheinische Stahlwerke, Meiderich, Germany. This engine has a rated capacity of 3200 effective horse-power and drives duplex blowing cylinders to furnish blast for furnaces. Exclusive of blowing cylinders and fly wheel the engine weighs about 250 tons. Its speed is 80 revolutions per minute. There is no reason why such gas engines should not be built in units to develop up to 5000 effective horse-power with blast furnace gas or 6000 effective horse-power with natural gas.

Essentially, large gas engines to operate with waste gases do not differ from those designed to operate with other gases, but the former demand certain precautions which may be ignored in the latter. It being practically impossible to remove absolutely all trace of dust from blast furnace gas, the valves and cylinders must, therefore, be designed to render the dust harmless; sliding surface must be, as far as possible, avoided, especially where tightness is a requisite, as in the case of valves. Corners or edges in the cylinder upon which the dust may settle are dangerous, even if out of contact with working parts, as the accumulated dust will become glowing hot and ignite the charge either upon its entrance to the cylinder or, worse, during its compression. The exhaust valves and passages must be so constructed and located that the dust and charred oil will be readily voided from the cylinder and not allowed to accumulate and destroy the pistons and walls, and all moving parts must be arranged so as to prevent the working in of dust between contact surfaces. It will be noted that these requisite qualities practically preclude the use of vertical gas engines with blast furnace gas.

It is not the intention to devote the remainder of this paper to the description of details of gas engine construction, but rather to a few considerations of general interest.

The Limit to Which Expansion Should Be Carried in a Cylinder.

It is perfectly feasible to proportion a gas engine or arrange its operation so that the gases in the cylinder will expand down to a terminal pressure near the atmospheric; but this involves a considerable reduction in the mean effective pressure developed during the stroke, and, therefore, for the same power necessitates a cylinder of large diameter, heavier moving parts, and, consequently, lower mechanical efficiency and higher first cost. For instance, the mean effective pressure in a gas engine operating with a terminal pressure of 10 pounds per square inch is only about 65 per cent. of the mean effective pressure in a gas engine operating with a terminal pressure of 35 pounds per square inch. Assuming equal mechanical efficiencies, the piston area per unit of power of the former must be 54 per cent. greater than that of the latter, while actually 60 per cent. excess would be required. Apparently the same volume of gas with the higher number of expansions would be performing 25 to 30 per cent. more work to partially compensate for the 60 per cent. increase in piston area necessitated, but no such gain in economy has been proved in practice. The question is essentially a commercial one and has been settled in favor of a terminal pressure between 30 and 40 pounds per square inch.

The compounding of gas engines is also perfectly practicable and has been frequently resorted to, even quite lately, but the results have always been the same—the gain of 10 to 12 per cent. in economy being more than annihilated by the increased cost of the compound machine.

There are other ways in which the exhaust gases from a gas engine may be made useful, such as generating steam, heating or drying operations, but it must be remembered that the capacity of the exhaust gases is not as high as their temperature of 600 to 700 degrees F. might suggest, because their specific heat is low, only about 0.24. In other words, it requires theoretically 10.8 pounds of exhaust gases at 650 degrees F. to evaporate 1 pound of water from 60 degrees F. to steam at 3 pounds per square inch gauge pressure; but actually about 15 pounds of such exhaust gases would be required. Approximately there can be obtained from the exhaust gas from a gas engine 1 boiler horse-power per 25 engine effective horse-power, steam pressure being 3 pounds per square inch gauge. With higher steam pressures the capacity of the exhaust gases would naturally diminish in consequence of the higher flue temperature in the boiler.

Scavenging—that is, by means of fresh air clearing the gas engine cylinder of all residue of the previous power stroke—while not materially affecting the economy, will increase the capacity of a gas engine some 10 per cent. in consequence of the increased weight of gas which may be drawn into the cylinder for each charge. But here, too, the gain does not warrant the complications, excepting where the gas engine is driving blowing cylinders, in which event a small portion of the blast may readily be by-passed and used for scavenging.

The Regulation of the Large Gas Engine

is receiving very wide attention, as witnessed by the increasing number of patents referring to this. The gas engine offers a much broader field in this respect than does the steam engine, because there are admitted to the cylinder of the former at least two distinct fluids, the conditions of admission of which may be controlled separately or jointly. The principles of steam engine governing may be divided into two classes—namely, 1, the admission into the engine cylinder of a constant volume of steam at variable pressure; and, 2, the admission into the engine cylinder of a variable volume of steam at constant pressure. The principles of gas engine governing are more numerous—namely:

1. The hit and miss, in which charges of constant quality and quantity are admitted to the engine cylinder at variable intervals.

2. The qualitative regulation, in which charges of a

constant total volume but variable proportions of air and gas are admitted to the engine cylinder at regular intervals.

3. The quantitative, in which charges of a variable total volume but constant proportions of air and gas are admitted to the engine cylinder at regular intervals.

4. Stratification, in which charges of a constant total volume consisting of a variable volume of clean air followed by a variable volume of constant proportions of air and gas are admitted to the engine cylinder at regular intervals.

The hit and miss is rapidly being relegated to a well merited oblivion.

The qualitative regulation is the simplest. The governor controls only the admission of gas by throttling the gas inlet. The chief drawback is that at low loads there is liability to miss fires, with consequent irregularity and waste of gas; or there will be incomplete combustion, either at full loads or at under loads.

Quantitative regulation may be performed in two ways, either by throttling the inflowing air and gas or by cutting the mixture off under control of the governor. The former method is simple and is probably the most satisfactory all around for smaller gas engines using illuminating or natural gas; its drawback is the increase of negative work with decreasing positive work and the consequent accentuated reduction of economy at under loads.

The cut off system is more delicate and expensive for small units, but gives somewhat better efficiency at under loads; but both systems possess the serious fault that the terminal compression is lowered as the load decreases, this in itself reducing the thermal efficiency of the engine, and, when lean gases, such as blast furnace gas, are used, tending to failure of ignition.

For large gas engines, especially those using lean gases, the stratification system offers the most advantages. In the operation of this system clean air is admitted to the cylinder from the beginning of the suction stroke up to a point which is set forward or back by the governor, and at which the admission of gas and air in fixed proportions commences, the inflow of the mixture continuing until the end of the suction or charging period.

If absolute stratification could be attained the cylinder, at the end of the suction stroke, would contain a varying volume of clean air next to the piston, the further end of the cylinder being filled up by an inversely varying volume of combustible mixture, and the contact surface between the two volumes would remain distinct of demarkation even after the compression of the cylinder contents. Such condition is, of course, unattainable, as a certain amount of diffusion of air and mixture occurs, the extent of which diffusion depends upon the time available for it. In a gas engine making 90 revolutions per minute this time amounts to less than half a second. It is certain, therefore, that after compression and at the moment of ignition the cylinder is filled with a mixture richest at the cylinder head and leanest at the piston, and, under an unaltered maximum compression, conditions which insure ignition, approximately perfect combustion and high efficiency at all loads.

It must not be supposed that because a gas engine requires no steam it can operate without water. On the contrary, the cooling of the gas engine cylinder, piston and exhaust valves consumes from 6 to 12 gallons of water per effective horse-power hour.

Regarding the thermal efficiency of the large gas engine under actual working conditions—that is, the thermal efficiency which it will attain under ordinary operation as against test results—some records recently obtained relating to a 1200 horse-power Nürnberg gas engine, running at 105 revolutions per minute and operating with blast furnace gas, show a consumption of 7568 British thermal units per indicated horse-power per hour, equivalent to an indicated thermal efficiency of 33.7 per cent. The mechanical efficiency is 83.1 per cent.; the actual thermal efficiency is therefore 28 per cent. gas to effective horse-power. Under test conditions fully 5 per cent. better efficiency would be obtained. A steam engine consuming per indicated horse-power per hour 16 pounds of steam delivered to the cylinder at a pressure of 150 pounds per square inch would, on the same basis, be consuming 18,600 British thermal units per indicated horse-power per hour, equivalent to an indicated thermal efficiency of 13.7 per cent, or, at 93 per cent. mechanical efficiency, a thermal efficiency of 12.8 per cent. steam to effective horse-power. The power consumed by gas cleaning reduces the total thermal efficiency of the gas engine plant to 24½ per cent., while the loss in burning the gas under boilers to generate steam reduces the total thermal efficiency of the steam engine plant to 9 per cent.

The Production of Open Hearth Steel in 1904.

The American Iron and Steel Association reports that the total production of open hearth steel ingots and castings in the United States in 1904 was 5,907,666 gross tons, against 5,829,911 tons in 1903, an increase of 77,755 tons, or 1.3 per cent. It was the greatest year on record.

The following table gives the production of open hearth ingots and castings by States since 1901:

States.—Gross tons.	1901.	1902.	1903.	1904.
New England	170,876	179,923	169,209	195,901
New York and New Jersey	82,985	92,763	104,598	165,986
Pennsylvania	3,594,763	4,375,364	4,442,730	4,306,498
Ohio	184,943	278,854	369,349	480,406
Illinois	398,522	435,461	422,919	358,215
Other States	224,220	325,364	321,106	400,660
Totals	4,656,309	5,687,729	5,829,911	5,907,666

The open hearth steel made in 1904 was produced by 115 works in 16 States—Massachusetts, Connecticut, Rhode Island, New York, New Jersey, Pennsylvania, Maryland, Tennessee, Alabama, Ohio, Indiana, Illinois, Wisconsin, Missouri, Colorado and California. One hundred and eleven works in 17 States made open hearth steel in 1903.

The production of open hearth steel ingots in 1904, excluding castings, amounted to 5,605,332 gross tons, against 5,429,563 tons in 1903, an increase of 175,769 tons.

In 1903 4,734,913 tons of open hearth steel were made by the basic process and 1,094,998 tons were made by the acid process, while in 1904 the production by the basic process amounted to 5,106,367 tons and by the acid process to 801,299 tons. In the following table the production by States of both acid and basic open hearth steel ingots and castings in 1904 is given:

States.—Gross tons.	Basic open hearth steel.	Acid open hearth steel.	Total Gross tons.
New England	147,390	48,511	195,901
New York and New Jersey	139,791	26,195	165,986
Pennsylvania	3,667,673	638,825	4,306,498
Ohio	427,948	52,458	480,406
Illinois	341,073	17,142	358,215
Other States	382,492	18,168	400,660
Totals	5,106,367	801,299	5,907,666

There was a decrease in the production of acid steel in 1904 as compared with 1903 of 293,699 tons, or over 26.8 per cent., but an increase in the production of basic steel of 371,454 tons, or over 7.8 per cent.

The total production of open hearth steel castings in 1904, included above, amounted to 302,334 gross tons, of which 98,919 tons were made by the basic process and 203,415 tons were made by the acid process. In 1903 the production of open hearth steel castings amounted to 400,348 tons, of which 134,879 tons were made by the basic process and 265,469 tons by the acid process. The decrease in direct castings in 1904 as compared with 1903 amounted to 98,014 tons. The following table gives the production of open hearth steel castings by the acid and basic processes in 1904 by States:

States.—Gross tons.	Basic castings.	Acid castings.	Total Gross tons.
New England, New York and New Jersey	17,193	27,285	44,478
Pennsylvania	5,831	128,579	134,410
Ohio, Illinois and other States	75,895	47,551	123,446
Totals	98,919	203,415	302,334

On Saturday, March 11, employees of the Homestead steel works of the Carnegie Steel Company received the largest two weeks' pay in the history of the plant, the amount being over $275,000. Every department of this great works is being operated to full capacity.

Rolls for Uneven Angles.—VIII.

BY WILLIAM HIRST.

Rectangular Sections Having One Flange Much Heavier Than the Other.

Fig. 29 illustrates a set of rolls for making a plain rectangular section, uneven in that one flange is heavier than the other, as in Fig. 10. If, as in this case, the thick flange is twice as heavy as the light one, the natural proportion of draft to be applied to that part would be twice as much. In the operation of rolling this essential inequality of draft causes a corresponding difference in the pressure on the opposite sides of the collar. If the sides of the passes were of the same angle relative to the axes of the rolls, this would cause an end thrust of the rolls, and though it may not be of great moment it would still be enough to give the rolls a tendency to work out of line. As there is no other point involved the pass may be balanced, as far as this particular is concerned, by turning it somewhat so that the passes would set as shown.

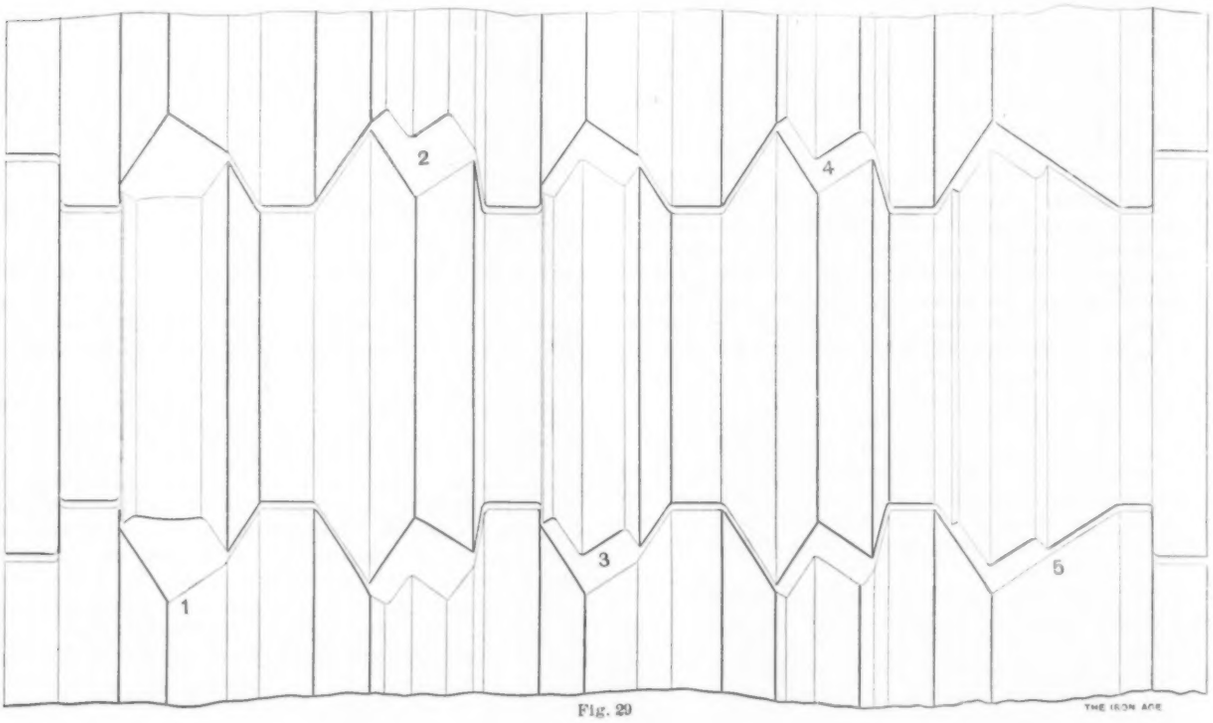


Fig. 29

It is of course next to impossible to state exactly how much the passes should be turned to effect a perfect balance, albeit a little careful judgment will usually suggest a position in which the tendency to work sidewise will be largely if not to all practical purposes entirely eliminated. We find also that this setting coincides with the requirements of the common principle in regard to setting a pass so that the displaced metal may be driven into the main body of the section. With this section, as with that of part 7, the light flange is set so that its position makes it the hight of the pass and is therefore in like manner susceptible of being drawn down. In laying out the passes allowance must be made for this, as in the case of Figs. 26 and 27.

There is much difference in the action of those parts of the pass referred to as forming collars which make incisions in the bar. As explained in the foregoing part in connection with the passes of Figs. 26, 27 and 28, the tendency is to draw down the hight of the pass, not from direct action of roll pressure but from the cohesive quality of the mass, and as a corollary the harder the metal is the more this is apparent. In the first passes of these figures it will be seen that the entrant collar engages the billet with a straight surface of some width, taking hold of nearly half of the billet at the first grip. The wider this contact is in proportion to the width of the pass the greater will be the tendency to draw down the flange. The purpose of the first pass of Fig. 29 is to roll down one corner of the billet, and its effect on the section otherwise is to slightly spread it. In pass 2 an incision is made in the bar by a collar pointed in section in which, compared with those of Figs. 26 and 27, the tendency to lessen the lengths of the flange is small. In these rolls (Fig. 29) the second, fourth and sixth collars forming the sides of the respective passes need not be carried up as high as they are, but to make them less would spoil the symmetrical appearance of the set, and would really add nothing to their strength, as the recess in the middle roll for the third would be the weakest part.

Except in the most simple cases where it is obviously unnecessary it is now the almost universal practice to adjust guides on both rolls, which when set together in position form a continuation of the pass in shape. These guides so set control on all sides the movement of the bar as it leaves the rolls, correcting any deviation that may result from an unproportioned draft or an improper

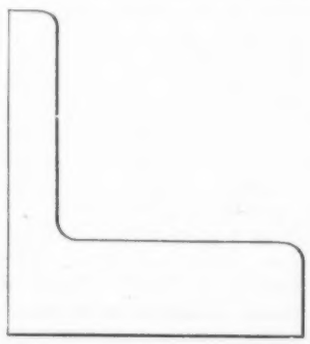


Fig.10

relation in the diameters in the pass. As has been shown, if the diameter of one roll is greater than the other, as referred to the pass, the bar will be driven or deflected toward the smaller roll. Formerly it was the practice to set passes in this way so that the bar would be deflected in one way all the time, when only a single guide need be used.

With the advent of three-high systems double guides were found to be necessary when the grooved roll was on top and the collar roll beneath, and the advantage in their use in the production of intricate shapes was soon recognized. With the use of the top and bottom guides, as the double variety is termed, the average diameters of both rolls may be made practically alike. As the

smaller diameters control the speed of the bar it would seem right to make the smallest diameter on the opposing rolls the same, considering each pass by itself. The illustrations in this article are drawn on this principle, and it is believed that their appearance in particular will commend the principle advocated. It is remarkable that in many cases little or no attention has been paid to this point. It has been found in many instances that this has been disregarded to such an extent that the differences in the pass have been something most unwarranted and wholly unreasonable. It is apparent that with the most favorable setting the slip—grinding in some cases—of the large diameters is considerable, and when this difference is needlessly augmented wear is greatly increased and power wasted through friction. Not only is wear increased and power wasted, but this is often the hidden and indirect cause of sundry breakages.

Conclusion.

In the foregoing illustrations the object has been to furnish concrete examples of the underlying principles upon which the passes are constructed. To make these illustrations certain conditions of service had to be assumed, and for the purpose of bringing them within the scope of this article they were grouped in the simple but compact manner shown. Under conditions now prevailing in the latest practice the series of passes would be divided and subdivided and arranged in the various parts or sections of what now constitute the modern mill. As to the passes themselves, they too were laid out especially for the purpose of illustrating as closely as possible the manner and method of their construction. Each pass embodies all the members of the finished section, bringing the bar after each stage closer and nearer throughout the series. As stated several times, radical changes in section are well avoided, and in the several series of passes the characteristics of the section are early established and maintained, so much so that the transition is just discernible.

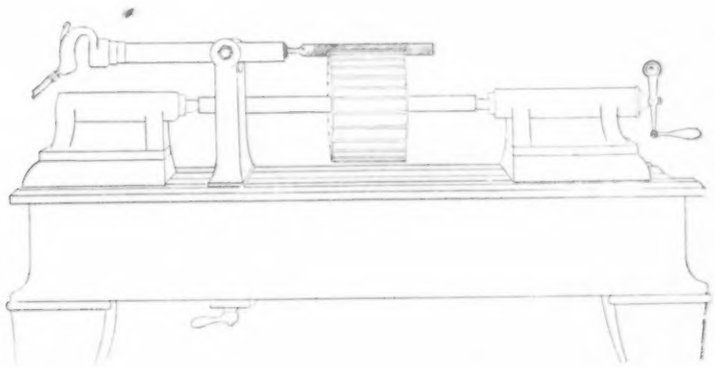
In these times of extremely high production everything is strained to that end. Strength and power are multiplied, the number of manipulations is lessened, fewer passes are used, and, in fact, every auxiliary is being adapted and readapted to reach the highest attainable output. To gain these results uniformity in effort is ignored and every advantage is taken. Passes instead of being designed as an orderly series are so laid out that each one is made to do all that it can possibly be made to do, too often regardless as to whether any injury is being done to the structure of the metal or not. Conditions requiring it and the character of the output being satisfactory, as these methods attain the end sought they are therefore considered correct.

(THE END.)

The New England Foundrymen's Association.—The monthly meeting was held at the Exchange Club, Boston, Wednesday, March 8. Vice-president Walter B. Snow presided in the absence of President John McGee, who is ill. The Reed Foundry Company, Worcester, Mass., was admitted to membership. Reports were received from the Committee on Securing New Meeting Quarters and from the Committee on the Pig Iron Storage Warrant System. Dinner was served after a discussion of quiz topics, and after dinner George H. Hull, president of the American Pig Iron Storage Warrant Company, New York, made an address on the use of the warrant and certificate system by foundrymen in supplying themselves with pig iron.

Filing with a Pneumatic Rammer.

A pneumatic sand rammer, used in a novel way, is illustrated herewith, showing one of the Chicago Pneumatic Tool Company's make, adapted to the filing of slots in armatures. A 1¼ x 7 inch rammer was selected because of its length of stroke and lightness. The rammer is pivoted in an extra head, which is mounted on the bed plate of the lathe, and is so balanced that with the file inserted it will feed into the slots of its own weight. The armature to be filed is supported on the lathe centers, so that it may be readily revolved. The rapid reciprocating motion of the rammer and the fact that it is held accurately in alignment permits the rapid filing of armatures, it being estimated that one machine of this kind will do as much work as five men working by hand, and that the character of work done is free from such irregularities as are necessarily associated with hand work.



Chicago Sand Rammer as Used for Filing Slots in Armatures.

The Chicago Municipal Museum.—The two upper floors of the Public Library Building, Chicago, are now devoted to a museum in which is displayed a great variety of information of interest and value to students of municipal engineering, sanitation and the long line of sociological problems that are interwoven with them. Models are exhibited, for instance, of the 250 horse-power rubbish incineration plant at Forty-seventh street and North River, New York, and the Barren Island garbage reduction plant in the same city. A noteworthy collection loaned by Friedrich Krupp shows the method of housing employees of the Krupp works at Essen. Model tenement houses in various cities are also illustrated. Much material in the form of models, charts and photographs comes from the German Cities Exhibition, which was held in Dresden in 1903. St. Paul and Minneapolis are represented by models and panoramas showing among other things the bathing beach on Harriet Island below St. Paul and the milling district of Minneapolis. A large panorama model in staff and wood shows the docks of Copenhagen. The New York Municipal Art Society has loaned a large collection of exhibits and the St. Louis Fair was drawn upon for much valuable material. Street cleaning, street sweeping, transportation, sanitation, housing and other municipal affairs are interestingly shown. One section is devoted to photographs and drawings of the world's famous steel bridges. The museum is the result of efforts on the part of public spirited citizens and of engineering, charitable and municipal associations.

The Svea Caloric Engine.

A new hot air engine, known as the Svea caloric engine, has been invented by G. Emil Hesse, and will be marketed by the Svea Caloric Engine Company, 119 Nassau street, New York City. In existing hot air engines the heat transfer is very slow, as the air is heated by the rising of warm layers into stationary cooler layers above. In the new Svea engine the cool air is split up into thin sheets and passed over heated plates, from which it absorbs radiated heat, the action being the reverse of that which takes place in a boiler where heat is given by the combustion gases to the tubes of the boiler, to be in turn conducted through them to the water within.

A 6 horse-power engine, drawings of which are illustrated, is now being built which has a cylinder 4¼ inches in diameter, a stroke of 4⅞ inches and will run at 450 revolutions per minute. It is self starting, double acting and reversible, like the steam engine, and is under positive automatic control. The part known as the heater is 20 inches in diameter, 16 inches long, and has a heating surface of 60 square feet. The engine, including the heater, weighs only 450 pounds and is therefore much lighter for its power than any hot air engine previously built.

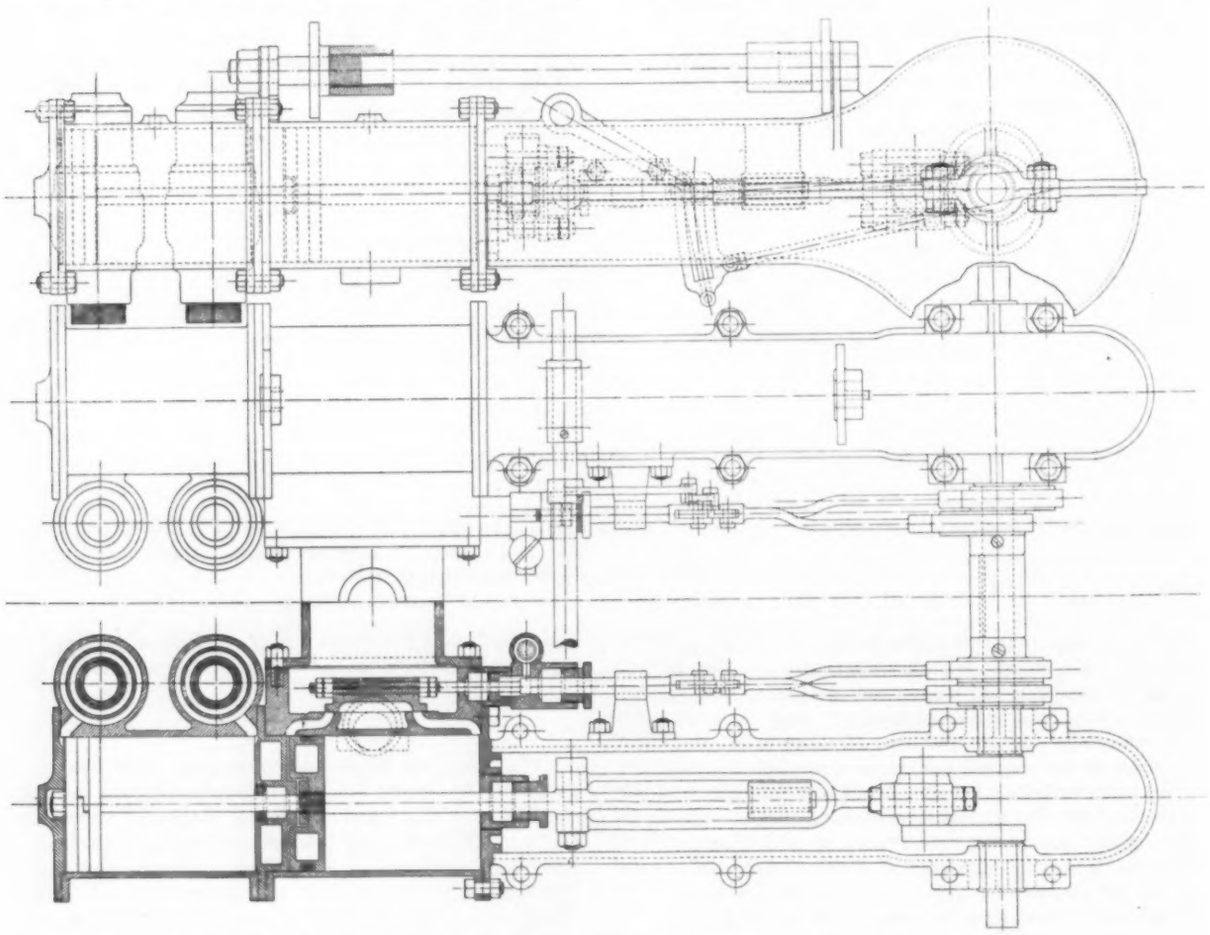
The principle of the engine's operation is as follows: Cool air is drawn into the rear cylinder at each stroke and on the return stroke is forced through the heater, where it is broken up into thin layers and passes over the hot plates, absorbing heat. From the heater it passes to the power cylinder, which resembles the cylinder of a steam engine and has an ordinary slide valve, and from there, after expanding and doing its work, is exhausted into the atmosphere.

A large stationary 100 horse-power engine is now being designed which will receive air under a pressure of 100 pounds per square inch and will use the same air over and over repeatedly by alternately heating and cooling it. The system of heating the air will be the same as that employed in the smaller sized engines, but an advantage will be gained in engines of large power by using the air under pressure because of the reduction which it permits in the size of the cylinder and other parts.

The principal feature of desirability in any hot air engine lies in the large amount of coal saved, due to the fact that no heat is required to vaporize the active medium, the air being already gas. The following calculation bears out this point: One kilogram of water at 100 degrees C. may be converted into steam of the same temperature by the expenditure of 537 thermal units. The amount of heat recovered by condensation is

$$\frac{10.334 \times 1.649}{424\left(\frac{10}{9}-1\right)}\left[1-\left(\frac{1.649}{14.55}\right)^{\frac{1}{3}}\right] = 76 \text{ units},$$

making a total loss of 537 — 76, or 461 units. This amount of heat has been lost merely in converting water into steam ready to be superheated, while air is already in the proper condition. As compared with a gas engine, the Svea engine has the advantage that no cooling water is needed for the cylinder, which eliminates a considerable loss of heat.



A New Hot Air Engine Manufactured by the Svea Caloric Engine Company, New York City.

The theoretical efficiency of the Svea engine taking air at 430 degrees C. and exhausting it at 40 degrees C. is

$$1 - \frac{273+40}{273+430} = 0.56 = 56 \text{ per cent.}$$

Practically, however, this point can never be reached, but by giving careful attention to every detail in the construction of the engine it is believed that it will be possible to very nearly attain it.

Semimonthly meetings are to be held by the heads of the nine leading departments of the Pittsburgh Coal Company, Pittsburgh, for the discussion of matters concerning the affairs of the company that will be of material interest. The first of the proposed meetings was held last week, and at the close the heads of the departments were entertained at the Duquesne Club. It has been the policy of the Carnegie Steel Company for many years to hold weekly meetings of the heads of departments, these being held on Saturday afternoon of each week.

The Outlook for Tariff Revision.

Senate Finance Committee to Sit During Recess.

WASHINGTON, D. C., March 14, 1905.—The Senate on the eve of the adjournment of Congress adopted a resolution authorizing the Finance Committee to sit during the recess for the consideration of "tariff, internal revenue and customs matters," and providing that the expenses of such sittings should be paid from the contingent fund of the Senate.

To Investigate the Revenues.

The resolution as adopted by the Senate is substantially in the same form as the measure which is almost invariably passed at the end of each Congress at the suggestion of the Finance Committee; nevertheless, at this time it has more than usual significance, as the committee contemplates a general investigation of the condition of the revenues with special reference to the necessity for the revision of the customs and internal revenue laws. This investigation, dealing at the outset with the condition of the revenues only, will be conducted privately, and will not involve public hearings of any kind. The information to be gathered will be sought in the records of the Treasury Department and from those officials who possess the greatest familiarity not only with the resources of the present revenue laws, but also with reference to the probable expenditures for the maintenance of the Government in the near future.

It is not likely that the committee will meet to map out its work before July. Senator Aldrich, chairman of the Finance Committee, is at present in Europe, but it is understood that he will return before July 1, and that he will have charge of such inquiries as the committee may decide to make. It is probable that the Republican members of the committee will consult with the President regarding the desirability of tariff legislation in the Fifty-ninth Congress, and that the President's decision with regard to an extra session in the fall for the consideration of tariff matters will have an important influence upon the committee's work.

Extra Session Probable.

The adjournment of Congress without action on the subject of Federal control of freight rates is believed here to foreshadow an extra session in October, as the President during the last month of the recent session frequently stated with much emphasis that unless Congress passed a law dealing adequately with this important question he would summon an extra session in the fall. The Senate Committee on Interstate Commerce has been authorized to sit during the Congressional recess to draft a bill increasing the powers of the Interstate Commerce Commission and providing otherwise for Federal supervision of freight rates, and it is understood to be the purpose of the committee to complete a measure in time for its consideration in October if the President adheres to his expressed intention of calling Congress together at that time.

Whether the President will insist upon the consideration of the Tariff at the projected extra session is a question of much importance and one as to which it is believed the Senate Finance Committee will exert considerable influence. The advice to be given the President by the Republican members of this committee concerning the necessity for revision will depend largely upon revenue conditions as they appear after the committee's investigation, and much therefore depends upon the revenue situation at the close of the current fiscal year. That there will be a considerable deficit is a foregone conclusion, but the amount of the shortage will have less influence with the committee than the tendency of the revenues and expenditures. If the prospect is for an increased deficit legislation of some kind will be deemed imperative. Of course it will be understood that the Ways and Means Committee of the House must take the initiative in the actual formulation of any new revenue measures, as the Constitution so provides, but the paramount influence of the Finance Committee in giving final shape to such legislation is so fully recognized that no general plan can safely be adopted until the views of the Senate leaders have been fully developed.

The Reciprocity Issue.

Much interest in the subject of reciprocity has been aroused by the recent conclusion of reciprocal trade agreements between Germany and the leading European countries, and the State Department is in receipt of many inquiries as to the present and future status of American exports in view of these conventions. The Department has also been urged to negotiate a treaty with Germany guaranteeing to American products the minimum rates of the conventional tariff of the Empire. The great importance of this matter is conceded by Administration officials, but action must depend upon the will of Congress as expressed in new tariff legislation, and hence the movements of the Senate Finance Committee will be followed with additional interest. In reply to inquiries the State Department officials speak very guardedly in any direct references made to the subject of reciprocity with Germany, but the Secretary of State and his aides do not hesitate to say very frankly that, in view of the fate of the dozen or more reciprocity treaties which have repeatedly expired while pending in the Senate, the Department does not feel justified in negotiating any additional conventions. The French treaty is referred to in this connection as having been renewed repeatedly, but completely ignored by the Senate.

With regard to the present status of American products exported to Germany, it should be understood that we now enjoy the minimum rates of the German treaty, but solely as a matter of grace. Indeed, the United States Government has always contended that the "most favored nation" principle does not apply to reciprocity concessions, and it is therefore obvious that we cannot claim as a matter of right the benefits of a minimum tariff which Germany grants to other countries only in consideration of substantial concessions. Reports are current that certain European Governments have protested to Germany against the continuance of the minimum tariff as applied to American exports on the ground that other countries should not be obliged to pay Germany for what she grants freely to the United States. The subject is one of considerable delicacy, and is being handled by the State Department with the utmost diplomacy. The Department officials hope that in any revision of the tariff that is undertaken a new basis for the negotiation of reciprocity treaties will be adopted that will insure the ratification of trade conventions that may be negotiated thereon.

Drawback Reforms.

The reform of the present drawback law will receive careful attention at the hands of the Finance Committee, whether the Dingley tariff schedules are overhauled or not. The matter has been the subject of much agitation in the past few weeks, and on the eve of the adjournment a measure was introduced in the House that will attract very general attention. It was presented by Representative McNary of Massachusetts, and provides under certain conditions for the substitution of domestic for imported materials in the manufacture of articles for export with benefit of drawback. The principle underlying the measure is that of the French drawback law, but the administrative features are quite different. The bill provides expressly for the importation of iron and other ores for the manufacture of goods for export, and is as follows:

Be it enacted, &c., That when imported duty paid materials used in the manufacture or production of articles manufactured or produced in the United States cannot be identified by the manufacturer or producer as material used in the manufacture or production of any particular article or articles of a lot so manufactured or produced, as required by the regulations established under section 30 of an act entitled "An act to provide revenue for the Government and to encourage the industries of the United States," approved July 24, 1897, a drawback may be allowed on the exportation of such particular article or articles equal in amount to the duties paid on a quantity of like material required to manufacture or produce such article or articles: Provided, that the like material used in the production of the lot from which the exported article or articles are taken shall at least equal in productive, effective and manufacturing value an equal quantity of the material required to produce such article or articles: And provided further, that when imported materials have been used under the provisions of this section such mate-

rials must have been imported by the producer of the exported article, or must have been traced to the possession of such producer for his use, and must be charged against the record of importation, as required by the regulations established by the Secretary of the Treasury under section 30 of the Tariff act approved July 24, 1897.

Sec. 2. That in lieu of the payment of duties assessable by law on iron ore or other metal ores imported into the United States there may be deposited in bonded warehouses, or in bonded cars or vessels, or in the custody of customs officials, iron or steel or manufactures of other metal ores equal in weight and value to the imported iron ore or other metal ores, and of the same quality as the iron or steel or manufactures of other metal ores which could be manufactured or produced from the iron ore or other metal ores thus released from payment of duties: Provided, that said iron or steel or manufactures of other metal ores shall not be removed from said bonded warehouses, cars or vessels, or from the custody of customs officials, except for export free of duty, or for domestic consumption upon the payment of duties equal to the amount which would have been levied and collected on the imported iron ore or other metal ores necessary to manufacture or produce the iron, steel or manufactures of other metal ores so withdrawn for domestic consumption; such deposit, custody and withdrawal to be done under such regulations as the Secretary of the Treasury shall prescribe."

It will be noted that under Section 2 of this bill manufacturers may avoid the necessity of paying duties on imported materials by bonding an equal quantity of domestic materials, which can only be withdrawn free of duty for export or for domestic consumption upon payment of the duties that would have been levied upon the materials imported. There will be considerable difference of opinion as to the desirability of such legislation, but the measure will undoubtedly attract a good deal of attention, especially as Mr. McNary has drawn similar bills as applied to several other leading industries.

W. L. C.

Trade-Marks in China.

In a recent circular Howson & Howson, solicitors of patents, 38 Park row, New York, say that in view of inquiries received from a number of clients relative to the present status of trade-mark registration in China they give the following information: During the fall of last year the Chinese Government adopted a set of regulations providing for the registration of trade-marks in that country, the regulations to go into operation October 23, 1904. Some of the measures proposed by the Government were, however, objectionable to local merchants, and the British and German ministers having protested against these features, the enforcement of the regulations was indefinitely postponed, and said postponement still continues. The regulations provided, among other things, that foreigners filing applications to register their home marks within six months—that is, on or before April 23, 1905—should have a right of priority, but that thereafter registration should be granted to the first applicant regardless of the date of first use or adoption of the mark. Inasmuch as the regulations have not yet gone into effect, it seems fair to assume that the period of six months priority granted to foreigners has not yet commenced to run; but some manufacturers are not willing to take this for granted and are now filing their applications with the intent to avoid any possibility of losing their right of priority and, in consequence, the use of their marks, in China. For those manufacturers who have a valuable trade in China it may, perhaps, be advisable to file their application to register at once.

The Allis-Chalmers Company's New General Manager.

Walter H. Whiteside has been made vice-president and general manager of the Allis-Chalmers Company, a position created for him and not conflicting with that of Vice President Chalmers or President Warren. Mr. Whiteside began his business life with the Dupont Powder Works, with which he remained three years, and which he left to go to the Cleveland Electrical Mfg. Company. After 12 years of service there he was secured by the Gates Iron Works, now part of the Allis-Chalmers Company. Then he was employed by the Westinghouse Electric & Mfg. Company, and his work there was recognized by the Navy Department in the installation of the great machinery used in Government dry docks still under construction.

From district manager of the Westinghouse Company's offices in Washington he was promoted to a department carved out by him, that of detail supplies, which became in a short time one of the largest and most profitable ones in the organization and carried with it the general managership of the Sawyer-Mann Electric Company, a subsidiary organization, as an additional duty. Last July, after nearly seven years of work for the Westinghouse Company, Mr. Whiteside went to the Allis-Chalmers Company. As manager of the sales department he also had control of the commercial organization of the Bullock Electric Company of Cincinnati, recently acquired by the Allis-Chalmers corporation. Carrying his energetic policy into the new company, Mr. Whiteside so expanded business in all branches that official recognition followed promptly in the establishment of a new position for him.

The Production of Pig Iron by Grades.

The American Iron and Steel Association publishes additional details of the pig iron statistics collected for 1904 as given below.

The following table gives the production of pig iron in 1903 and 1904 by grades in gross tons:

Grades.—Gross tons.	1903.	1904.
Bessemer and low phosphorus	9,989,908	9,098,659
Basic pig iron made with mineral fuel	2,040,726	2,483,104
Forge pig iron	783,016	550,836
Foundry and high silicon	4,409,023	3,827,229
Malleable Bessemer pig iron	473,781	263,529
White, mottled and miscellaneous	120,137	53,284
Spiegeleisen	156,700	162,370
Ferromanganese	35,961	58,022
Totals	18,009,252	16,497,033

The Bessemer figures include low phosphorus pig iron—that is, iron running below 0.04 per cent. in phosphorus. Pig iron containing from 0.04 to 0.10 per cent. of phosphorus is classified as Bessemer. A few thousand tons of castings direct from the furnace are included in the totals for white and mottled and miscellaneous grades of pig iron for 1903 and 1904. Ferrosilicon and high silicon pig iron are included in the foundry figures.

In 1904 the production of low phosphorus pig iron amounted to 190,946 tons, against 200,422 tons in 1903. In 1904 low phosphorus pig iron was made in New York, Pennsylvania and Tennessee.

Included in the 3,827,229 tons of foundry pig iron made in 1904 are 69,730 tons of ferrosilicon, produced in Pennsylvania, Virginia, West Virginia, Kentucky and Ohio, a small part of which was made with electricity. In 1903 51,516 tons of ferrosilicon were made. Pig iron containing 7 per cent. of silicon and over is classified as ferrosilicon. Virtually all the charcoal pig iron made is classified as foundry pig iron. Alabama is now the leading producer of foundry pig iron and Pennsylvania of forge.

The production of malleable Bessemer pig iron in 1904 amounted to 263,529 tons, against 473,781 tons in 1903. In 1904 the production of white and mottled and other miscellaneous grades of pig iron and direct castings amounted to 53,284 tons, against 120,137 tons in 1903.

The production of spiegeleisen and ferromanganese by States in 1903 and 1904 was as follows, in gross tons:

	Spiegeleisen.		Ferromanganese.	
States.—Gross tons.	1903.	1904.	1903.	1904.
New Jersey	15,346	11,242	....	....
Pennsylvania	76,493	103,773	34,871	57,076
Tennessee	....	....	....	946
Alabama	24	....	1,090	....
Illinois	57,955	39,799	....	....
Colorado	6,882	7,556	....	....
Totals	156,700	162,370	35,961	58,022

The figures given for ferromanganese for 1904 include a small quantity of ferrophosphorus made in Tennessee. Ferrophosphorus was not reported for 1903, but a small quantity was reported by Alabama in 1902. Spiegeleisen usually contains from 9 to 22 per cent. of manganese, and ferromanganese from 45 to 82 per cent.

Notes from Great Britain.

The Market.

LONDON, March 4, 1905.—The iron and steel markets in all parts of the country during the past fortnight have been blowing hot and cold with almost daily alternation. We are just at the present subjected to the possibility or the suspicion of outside influences, although at the moment the home trade is undoubtedly king over all. In the steel section particularly there is talk of German competition, but it looks as if the German syndicate is making no new offers of any importance, being content with present contracts.

A number of merchants who bought German steel some time ago, when prices were low, are trying to unload stocks. They were offering from 84 to 86 shillings; less, by the way, than the present price quoted either by the syndicate or by British makers. Quotations by the latter are largely nominal. Some British makers are asking 87 shillings 6 pence for Bessemer qualities; others demand as high as 91 shillings. Both prices are, as a matter of fact, wide of the mark, the truth being that makers are feeling the market without committing themselves; nor is there at the moment a large inquiry. There is considerable activity among structural steel makers, who have a sufficient weight of contracts on hand to insure the continuance of this activity for some months to come.

The Demand in the Transvaal.

The report of the Transvaal Government mining engineer, just issued, should be carefully studied by American exporters. During the year 1904 the Transvaal gold mines purchased more than £9,500,000 worth of goods, of which amount above £250,000 was purchased direct from home and foreign firms. The remainder was purchased locally from houses stocking mining requisites. The following figures of purchases for 1904 prove conclusively how enormous is the purchasing capacity of the Rand mines:

New machinery	£2,073,055
Bolts, nuts, rivets and washers	24,065
Brass and iron castings	53,159
Electric light and power fittings	85,790
Hand tools, screws and nails	39,861
Iron bar, galvanized and sheet	88,331
Machinery	998,330
Pipes and pipe fittings	203,277
Rails, crossings, &c.	74,233
Rock drills and rock drill parts	105,537
Wire ropes	45,672
Shoes and dies	60,654
Steel, tool and drill	135,895
Total	£3,987,869

All mining machinery, &c., is admitted duty free, consequently 2½ per cent. preferential duty is of no assistance to British manufacturers in their endeavors to retain the trade with the Rand mines. At the lowest computation more than £1,000,000 worth of goods was purchased by the mines last year from American and German manufacturers.

Standard Screw for Guns.

After the lapse of four years the War Office Committee of Engineering and other experts appointed to investigate the possibility of producing an interchangeable screw for gun fittings and other work requiring the highest possible degree of accuracy is about to issue its report. It is understood that the committee will be able to declare that, as a result of exhaustive experiments, a standard screw has been produced that is as near scientifically perfect accuracy as can be hoped to be obtained. Dr. Stanton states that in the completed screw, 3 feet in length, there is not a deviation in any part of more than one ten-thousandth part of an inch.

A Wages Board Bill.

A measure has been brought before Parliament which, if carried, will raise industrial issues of the very greatest importance. It is a bill to provide for the establishment of wages boards with power to fix the minimum rate of wages to be paid to workers in particular trades. It is left to the Home Secretary to say for what trades wages boards are to be appointed, so that, at all events in the first instance, wages boards need be appointed only for what are known as the "sweated industries"—that is, industries in which outworkers are largely employed and in which the rate of remuneration is low.

A wages board will have power if it thinks fit to fix a minimum rate for any particular kind of work, or for any single class of workers in a particular trade. It will have the widest discretion as to fixing a time rate or a piecework rate, and as to varying the minimum according to the kind of work and the class of persons employed. The bill provides that a wages board shall be composed of representatives of employers and employed, in equal numbers, with a chairman chosen by the members or nominated by the Home Secretary. It is proposed to intrust the enforcement of payment of the minimum rate to factory inspectors.

Huge Crane for Cape Town.

Cowans, Sheldon & Co., Carlisle, have completed the construction of a huge crane to be used in extending the harbor at Cape Town. It is technically known as the Titan, and has the largest radius of any built. Its working load will be 40 tons, which is not an unusual power, but its radius extends to 115 feet, and at that distance from the center of its traveling carriage the crane has been tested with a load of 50 tons. The hight of the crane from the ground level to the house roof is 51 feet and to the crab rails 36 feet. Steel has been used in the construction wherever possible, only the heavier castings being of iron. So as to offer a minimum resistance to the wind the girders are lattice built and are strongly braced on each side. The lifting speeds are 8 feet per minute, with the full test load of 50 tons, and 50 feet per minute with 10 tons. The full load has to be completely revolved in three minutes, and the whole structure with its maximum load has to travel 50 feet per minute. All these speeds were exceeded at the test. The great power required to work the crane may be gathered from the fact that the weight of the Titan itself, exclusive of ballast, is 425 tons, about 300 tons weight being in the superstructure and the remainder in the carriage. To this the ballast and test load added about 180 tons, so that the total weight to be propelled is about 600 tons.

Swedish Iron Ore Export.

The total amount of Swedish iron ore exported from Narvik during the year 1904 aggregated 1,188,500 metric tons, of which Germany took 760,900 tons, Great Britain 286,500 tons, Belgium 94,500 tons, France 36,400 and North America 10,200 tons. It is expected that the exports of iron ore will show a steady increase in the next few years. The mining operations in the Urtvand district have now begun, and it is estimated that a daily production of 5000 tons of ore will be in full swing by the summer of this year, and that the export from this district alone will then amount to 750,000 tons per annum.

New South Wales Iron and Steel.

The Government of New South Wales has decided to invite tenders in connection with the development of the iron and steel industry of the colony. The Government has had supplementary reports from the chief inspector of mines on the question of the amount of iron ore in sight or available. In connection with the Cadia deposit in the Orange district, convenient to railroad, he says that while four years ago he estimated the amount of ore in sight at 1,000,000 tons, fuller examination justifies him in stating that there are in sight at least 4,000,000 tons of ore suitable for the manufacture of steel by the cheaper acid processes, and that it is probable that further prospecting operations would prove the deposit capable of yielding 10,000,000 tons by quarrying. Since his inspection in 1901 a tunnel 29 feet long had been driven across the bed, and the ore samples gave 60.72 per cent. iron, 9.02 silica, 0.01 per cent copper, 0.035 per cent. sulphur, 0.10 per cent. phosphorus. At the Carcoar district, convenient to the Lithgow Iron Works, there are over 3,000,000 tons of ore in sight yielding 53 per cent. iron, 10 per cent. silica and 0.09 phosphorus. The cost of producing pig iron from such ore is estimated in the report at 47 shillings 7 pence, excluding interest on the capital involved in blast furnaces, &c. S. G. H.

THE IRON AGE

1855—1905.

New York, Thursday, March 16, 1905.

DAVID WILLIAMS COMPANY, - - - - - - - - PUBLISHERS.
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Raw Materials for Basic Open Hearth Steel.

A very interesting development has been going forward in the basic open hearth steel industry. It will be recalled that the first commercially important adoption of this process in the United States was about a decade ago, while in the preceding decade the process had undergone extensive adoption abroad, with many changes in the details of practice.

The question of a scrap supply has been the most important element governing the evolution of the basic open hearth steel industry in the United States. This is but natural considering that in 1896, the first year for which separate statistics were returned, there were produced in the United States only 776,256 gross tons of basic open hearth steel ingots, while eight years later, in 1904, the production as just returned was 5,106,367 tons, or more than six times as great. In the early days this process was regarded with favor largely because it offered a ready means of utilizing scrap, which was then cheap, while by its rapid expansion it has now made scrap dear, to such an extent that a number of sales of heavy melting scrap have been made within the past few months at a somewhat higher price, delivered, than that for which basic pig iron could be purchased. Almost as soon as this process for utilizing scrap became well founded. the engineers began to cast about for means to avoid the use of this very material, from which have come the Talbot, Monell and accessory converter processes.

It has long been recognized in self contained steel works in the United States, with blast furnaces and Bessemer converters, that the blast furnace is entirely the servant of the steel works, that it has no rights of its own. With the basic open hearth steel process this principle was not recognized so early, largely from the incident that a greater percentage of basic open hearth steel is made from purchased pig iron than is the case with Bessemer steel. The furnace manager is less disposed to submit to the dictation of a chance customer than to the dictation of a common owner of both steel works and blast furnace. Gradually this has been changing. The steel works manager knows better than formerly what he wants in his pig iron, and the furnace is more disposed to give it to him. With the increasing relative price for scrap the steel works is willing to pay a slightly better figure for the pig iron, which is of course an inducement. A few years ago basic pig iron ruled pretty regularly at a dollar or so a ton below Bessemer pig; of late the two have been selling at almost, if not exactly, the same figure. Until a comparatively recent time the recognized contract specification for phosphorus was a limit of 1 per cent., although at no time was there a great deal of Northern iron made approaching this limit. Lately it has been possible to have written in the contract a limit of 0.50 per cent on Northern iron, while with some producers it is possible to obtain a guarantee of not over 0.30 per cent. in phosphorus, the iron actually running, say, from 0.20 to 0.25 per cent. The importance of phosphorus in fixing the value of basic pig iron appears, however, to have been overrated in some quarters, which is indicated by the following incident: A steel works which had been using a basic pig running under 0.50 in phosphorus was solicited to buy a totally different variety, averaging about 1 per cent., and, objection being raised, the seller offered to ship 200 tons and accept a check for whatever the steel works considered the iron actually worth, provided it would carefully study the results obtained. The outcome was a voluntary settlement at only 30 cents per ton under the recognized price for the iron running more than ½ per cent. less in phosphorus. This small difference is not claimed to have proved that phosphorus in itself is of such little importance, because the higher phosphorus iron ran only about 0.40 per cent. in silicon. Rather it points to the importance of silicon.

When the statistics of pig iron production in 1904 by grades appeared it was rather noteworthy that although the total production showed a decline of 1,512,219 tons from 1903, the production of basic pig (made with mineral fuel) showed an increase of 442,378 tons, the decrease in all grades other than basic being 1,954,597 tons. This increase in basic pig production was not due entirely to the increase in basic open hearth steel manufacture, since the increase in the latter was only 371,454 tons. A greater proportion of pig iron and a smaller proportion of scrap was used in 1904. Comparisons such as this are only rough, but they are indicative. In 1903 the tonnage of basic pig produced was 43.1 per cent. of the tonnage of basic open hearth steel ingots. In 1904 the percentage rose to 48.6 per cent. This percentage has varied somewhat irregularly. In 1896 it was 43.3 per cent.; the following year it rose to its maximum, 52.7 per cent.; the minimum was 1901, with 40.0 per cent. It is quite possible that the low percentage shown in that year was an accident, since it is well known that at one time considerable quantities of substantially Bessemer iron were used, rather as an experiment, in making basic open hearth steel, and it is not known just how this iron was returned for the statistics. The practice did not become fixed, as a little higher phosphorus, with lower silicon than in standard Bessemer, naturally gives better results.

Many forecasts have been made as to the future supply of scrap. It is an inviting field because it has few limitations but those of the imagination. Some points, however, appear obvious. As basic open hearth steel production has increased much more rapidly than total steel production, the demands of the industry are certainly becoming harder to meet. In eight years basic production has increased from almost nothing to 5,000,000 tons; from a record production of a trifle under 5,000,000 tons nine years ago Bessemer ingot production touched 9,000,000 tons in 1902, but declined to less than 8,000,000 tons last year. In nine years the total pig iron production has scarcely doubled. Again, it certainly seems that a smaller proportion of the total pig iron of the country is being converted into good scrap producing irons. Rails, the great scrap producer, constitute a less and less proportion of the total output. Many years used to be shown in which the tonnage of rails exceeded one-fourth the tonnage of pig iron. On the other hand, an increasingly large proportion of the total pig iron is being converted into such light lines as wire, sheets, tin plates, hoops and bands, &c., obviously poor scrap producers.

It would appear that in the future the scrap used in the basic open hearth steel industry will be a decreasing quantity, more and more confined to the new material, crop ends, shearings, &c., which can always be counted

upon, while the demand upon the blast furnace for pig iron of an analysis contributing to economy of conversion into steel will be more and more exacting.

Inadequate Fire Protection for Manufacturing Interests.

It is a too frequent complaint that cities and large towns fail in their duty to afford sufficient fire protection for their manufacturing interests. The authorities who have the power in such matters are prone to consider that the requests of owners of manufacturing property are extravagant and selfish. This is not the rule, to be sure. While many places take most excellent care of property which may be exposed to destruction by fire, the exceptions are not uncommon. This is well illustrated in a recent instance in a New England city which is deficient both in hydrant service in manufacturing neighborhoods and in apparatus.

The city in question has grown prodigiously during the past generation, through the increase in its manufacturing industries. There has been no other reason for growth. Its interests are almost entirely industrial, and its new growth and new wealth are due to the prosperity of existing manufacturing establishments and the addition of new ones. Yet when the combined manufacturing interests of the city asked the city government to provide funds for an increase in fire protection commensurate with the property interests at stake their spokesmen were greeted as extravagant and wholly selfish petitioners who would make the public pay to better their own personal welfare. The argument against the proposed increase was that "the interests of the small taxpayer must be guarded," and so it was held by a sufficient faction of the city government who stood by the Mayor in the fight against the appropriation. This is a concrete instance of a policy which, excepting where fortune is wonderfully kind, means the eventual great loss of property, and, to consider the matter from the standpoint of the selfsame small taxpayer, a great loss in employment, upon which the incomes of workmen and pretty much every one else in an industrial city must depend.

A manufacturing city that wishes to grow in its existing industries and by attracting new industries must have a first rate fire department and water supply tapped by hydrants at frequent intervals, in order that the apparatus may be used to most telling advantage when fire is raging. It is not a selfish desire on the part of a manufacturer to have ample fire protection. He is a large taxpayer and is entitled to it. So are his workmen, who are small taxpayers. They need to be protected from loss to their tools, which, relatively speaking, are valuable, and, more important still, from the loss of wages which must result from the destruction, partial or complete, of the works in which they are employed. Another element entering into the consideration of fire protection is the item of insurance. The insurance companies must consider municipal fire protection in establishing their base of premium in a given city or town. If protection is good the rate must be lower than where it is inadequate.

In the case of the city referred to it was proposed to fund a loan of $100,000 to provide more apparatus and better hydrant service. This meant no great annual expense for interest and sinking fund. The amount, plus additional cost of maintenance, is not a great item for a city of nearly 100,000 people. Those who would bear its burden are the taxpayers, whose property would be better protected. The usual argument in such cases was raised that "we have never had a fire that our present department was not able to cope with." Many a community has had this argument refuted by the flames of a conflagration that plenty of water and apparatus to handle it with would have extinguished in its infancy. An ounce of prevention is worth a pound of cure, and the fire department is the prevention. Great industries can be put out of business for months by this same short sighted policy, cutting off a substantial income to the town in the aim to reduce the tax rate by squeezing the fire department appropriation.

A Time Sale Is a Money Loan.

When a manufacturer sells a merchant or another manufacturer a bill of goods on 60 days' time he is virtually loaning his customer the price of those goods for that time. The customer takes the merchandise loan for granted, and is very apt to seek, by delays and excuses, to extend the original 60 days without interest a much longer time. If the buyer were to go to his bank and borrow the money necessary to pay for the goods on the same 60 days' time he would not only have to pay the legal rate of interest, but a premium besides, and if he did not meet the obligation on its maturity would have to satisfy the bank that the account was good and collectible, and, of course, pay interest for the extended time.

Does the salesman realize when he is closing a sale with a customer that he is virtually lending that customer a sum of money equal to the value of the goods for the period that shall elapse before payment is made? And does the buyer realize that in asking for credit, be it for only ten days, he is asking the seller the favor of a cash loan? Unfortunately the salesman is rarely as careful to secure himself on his merchandise loan as the bank would be in making a money loan. And unfortunately the buyer, from his superior hight, sometimes fails to realize that when he "favors" the seller with an order he is asking a favor in return.

A realization of this actual relationship between buyer and seller would lead to greater self respect and firmness on the part of the seller, and, what is more important, fewer losses; while there is many a buyer whose attitude toward the seller would be vastly improved by a recognition of this homely truth, and who would steer his course clear of many a dangerous financial rock thereby. The seller is a partner with the buyer to the extent of his sale during the period elapsing until payment is made, and as such has a right to know the financial condition of his creditor. This sense of partnership is rarely recognized by either party to the sale.

College Boys as Strike Breakers.

While the management of the strike on the Interborough system in New York was admirable, one minor mistake was made, which we trust will not be repeated in any part of the country. An offer of employment was made to students at Columbia University, which was accepted, largely as a lark, by quite a number of the boys. Newspaper reports indicate that some of the professors of the university rather encouraged the students to enter employment which could at best be only temporary, since the boys are supposed to be engaged in preparing for a profession—a work which, as it is, suffers from only too many distractions. We do not blame the students when they seize upon an opportunity for excitement and for attracting public notice. But it was a serious mistake

on the part of the college authorities to permit the boys to become strike breakers, because it fosters a class feeling, which should be studiously avoided. The pupils of an educational institution must not be placed in the position of participating in an industrial struggle. The day of learning the management of men must come to many of them when they enter upon their life work, but until they have left the university they should not be allowed to intervene as students, whatever they may do as individuals during their vacations. In the eyes of a very large proportion of our citizenship a certain odium attaches to every strike breaker, and our highest institutions of learning should not go out of their way to fasten that odium upon themselves.

We hold the belief, too, that the managers of the Interborough system made a tactical mistake when they invited engineering students to accept such employment, because it was obvious on the face of it that those who responded to the call could do so for only a very brief period. It gave strength to the conviction which the strikers themselves generally hold that strike breakers are employed for only a brief emergency and that few of them settle down as regular employees who permanently occupy at least some of the places of the strikers.

CORRESPONDENCE.

Cost Systems as a Part of Technical Training.

To the Editor: I was greatly interested by the editorial suggestion in your issue of March 2 that students in technical schools be taught the rudiments, at least, of cost keeping. From my observation in a great number of manufacturing establishments in different parts of the country, I would say emphatically that instruction in this subject is most desirable and essential. Almost every factory has a cost system, but it is rare indeed that one is found which is not open to serious objection. There is many a large establishment manufacturing several different lines of goods, varying in proportion at different seasons of the year, where the cost system in use is not equal to the task of showing the cost of each of the individual articles of manufacture, although it may show to a penny the cost of operating the factory. I recall several instances of this kind where, being called in, we found that while the operation of the factory as a whole was most profitable one line of goods had been manufactured at an actual loss. In each instance the making of the unprofitable line was immediately discontinued.

If technical students were trained as to the proper method of making an inventory, much good would result if this one lesson were well learned. Perhaps I can best illustrate this important point by relating an occurrence which recently came under my observation. A large manufacturer, greatly perplexed, came to us and said: "My sales have been about the same as last year; materials and labor have been higher, yet my books show that I have made a much larger profit. What is the matter?" It did not take a long examination to show that the error lay in his inventory. He had started the year with a comparatively small stock of goods, and had ended with a large quantity on hand. These latter he had inventoried not at their cost of manufacture, but at their selling price. Therefore his profit and loss account for the year erroneously included all the profit which would be realized when the supply of goods on hand was sold.

It might be thought that such an error would have been obvious to him. As a matter of fact this particular manufacturer had followed this system of inventorying for years. As his supply of goods at the beginning and his supply at the end of each previous year had been practically equal, one error had balanced another and the discrepancy had not before displayed itself. Few manufacturing establishments make an inventory to which exception cannot be taken. Many other instances might be cited tending toward the same conclusion—that the more thoroughly technical students are trained in cost keeping and cognate subjects the better fitted they will be for executive positions in manufacturing establishments.

P. W. POGSON.

NEW YORK, March 13, 1905.

Central American Notes.

SAN JOSÉ, C. A., February 28, 1905.—Whenever there is any agitation about matters in Santo Domingo, Hayti, &c., there is sure to be a noticeable change in the Central American countries. Trade becomes slow and everything takes on a color of expectancy, requiring often a month or two to bring things back to normal conditions. There is certainly no denying the fact that nearly all these countries ran into debt to foreigners for millions, and often tens of millions, under the belief that they were safe from troublesome creditors by the courtesy of the United States. So now, with the Santo Domingo matter in view, many of these countries are wondering when their turn will come next. Still, railroad building has not suffered, and with the dry weather a number of bridges have been put in on the Guatemala Northern. The Chiapas and Tehuantepec lines are importing Japanese laborers for their extensive work west and southward.

Down the coast business between Peru, Chile and Ecuador and the United States has doubled in the last year or so, and the British and Germans are looking to their laurels. Mining machinery, rails, foodstuffs and furniture from the North are exchanged for chemical products, ores (gold, silver and copper), wool and medicinal plants. Nitrates also form one of the principal exports from the western coast of South America.

We could do more business in general if our catalogues and letters were in "South American" Spanish, meaning by this that, although it is all one language—Castilian—still the Latin American uses many nouns or names of objects which are peculiar to his region and often not Spanish at all, but of Guareni, Kiché, or other native origin. It is wonderful how quickly they are interested when they find things in their native language.

Revolts in Nicaragua seem to be getting epidemic; the last one cost several lives. No interruption has occurred on the Cocos River dredging, and the mining people are reporting finds of value. If the Pan-American Railroad extension is carried out in Honduras the Yuscaran gold region and the Yoro iron and copper mines will soon make a name for themselves. It is the development of this class of exports which will make these countries valuable consumers of the manufactures of the United States.

Several thousand laborers have left these parts for Panama and the canal work. Hundred of Jamaica negroes are also on their way there. Altogether, the canal work is much more active than it was six months ago.

San Francisco, Cal., is getting a large percentage of the business from ports like Acajutla, Acapulco, Guayaquil and Callao. Many of the ores of copper and gold from interior mines are smelted in California, reaching there mostly in German bottoms. The Boleo or Rothschild copper mines in Baja, Cal., are producing enormously, the exports of metal and mineral being made directly to France.

Immigration from the United States to Sonora, especially Topolobampo and Guaymas, has made the people acquainted with American goods, machinery, &c., and imports of these are constantly coming in on the Pacific Mail and German steamers. Mazatlan, the terminal of the Durango Railroad, will leap into importance as soon as the line is completed to this Pacific terminal. C.

An error was made last week in stating that J. W. Gephart, deceased, was president of the Nittany Iron Company, Bellefonte, Pa. At the time of his death Mr. Gephart, who had been president, was not connected with the company in any capacity, and had not been since last June. Noah H. Swayne, 2d, is president and general manager, and W. W. Waddle is secretary and treasurer.

Labor Notes.

The Iron Molders' Union of North America introduced into the Michigan Legislature, through Senator Martindale of Detroit, a bill prescribing all sorts of impossible conditions for the sanitation, lighting and heating of foundries in the State of Michigan. A large delegation of labor officials was on the ground in an endeavor to lobby the bill through, but the foundrymen and stove men of the State were equally on the alert and had their delegation also, among whom active parts were taken by William Thompson of the Kalamazoo Stove Company, Clarence E. Bement of Lansing, George H. Barbour of the Michigan Stove Company and a delegation of foundrymen from Grand Rapids, Lansing and Detroit, including E. S. Porter, chairman of the State Manufacturers' Association. The employers demonstrated to the committee holding hearings that it was impossible for any one foundry to comply with all the requirements and that there was no foundry in the State but that would find it impossible to comply with some of them. The delegation opposing the bill made it very plain that the labor officials were seeking to enforce more drastic legislation as to foundries than applied to any other form of manufacture; that there was practically no office, store, hotel, dwelling or school house or any private or public building that could comply with all the restrictions of the bill in regard to natural light, to say nothing of the number of other conditions equally impossible. Immediate passage of the bill was prevented but it is not yet known whether it has been permanently defeated. It was intimated that this move on the part of the Molders' Union in Michigan was simply a forerunner of similar moves in all State Legislatures.

A very spirited newspaper controversy is now going on in Racine and Milwaukee newspapers between the Iron Molders' Union and T. J. Neacy, vice-chairman of the Sixth District of the National Founders' Association, and secretary and general manager of the Filer & Stowell Company, relative to the strike now in force in the foundry of the J. I. Case Threshing Machine Company at Racine. An effort has been made by the labor leaders to induce the City Council of Racine to forbid the housing of nonunion molders in buildings now used for this purpose on grounds of public safety and sanitation, the effort being to create an impression that the nonunion molders brought in to break the strike were desperadoes. Mr. Neacy vigorously takes the part of the nonunion men, and contends in his newspaper articles that their average of personal virtue is fully on a par with that of the strikers whom they displaced. Meanwhile we are informed that the plant is running practically full handed, and that the molders are all making over $4 a day net, with some of them making more than double that amount.

Sheet metal contractors of Chicago endeavored recently to secure an open shop concession from the Amalgamated Sheet Metal Workers' Union, but were informed that the only condition on which an open shop could be secured was an "open town." By this was meant that the unions, which have heretofore worked with the local contractors in preventing outsiders from bidding on Chicago contracts, would no longer continue such arrangement. A two years' contract was finally entered into by which the contractors agreed to employ only members of the local unions, wages being unchanged at 50 cents an hour, the men agreeing to refuse to touch work done by outsiders paying less than Chicago rates in their shops or for erecting.

On March 13 officials of the Amalgamated Association met James H. Nutt, labor commissioner of the Republic Iron & Steel Company, at Youngstown, Ohio, for the purpose of arranging the puddling and finishing scales for March and April. It was found that the average price of shipments of bar iron made by the mills for January and February warranted an advance in the puddling rate for March and April from $4.90 to $5.12½ and an advance of 2 per cent. in the finishing scale. Figures submitted by Mr. Nutt showed that the average price at mill of shipments of iron bar in January and February was a little above 1.4 cents.

PERSONAL.

An address by William G. Mather of Cleveland, Ohio, president of the Cleveland-Cliffs Iron Company, will be the principal feature of the second annual class day exercises of the Michigan College of Mines, to be held in Houghton and Hancock, Mich., May 5.

George Thompson, one of the founders of the Star Shovel & Range Company, Vincennes, Ind., and who for many years managed its predecessor, the Enterprise Stove Company, has severed his connection with the establishment.

A. S. Crane, for three years assistant to the chief engineer of the Drainage Board, Chicago, resigned March 1, to become chief hydraulic engineer of a large New York firm.

D. W. Bosley, Chicago, a large manufacturer of weather strips, will return late in April from a four months' pleasure trip through Southern Europe, Palestine and Egypt.

John E. Lonngren, who has been assistant superintendent of the wire mills of the American Steel & Wire Company at Donora, Pa., has resigned to accept the position of superintendent of the wire and nail mills of the Colorado Fuel & Iron Company, Pueblo, Col.

John Means, formerly superintendent of the blast furnaces of the Carnegie Steel Company at Donora, Pa., has accepted a similar position with the Colorado Fuel & Iron Company, Pueblo, Col.

D. H. Burnham of D. H. Burnham & Co., Chicago, architects, has returned from the Philippines, where he went upon the request of the Government to look over Manila with a view to improving and beautifying the city.

Henry Phipps, who is now in Mexico, is stated to have denied the report that he is endeavoring to purchase the Monterey steel plant, asserting that his active days in the steel industry are over for all time.

M. T. Hanley, superintendent of the Muncie and Indiana works of the Republic Iron & Steel Company, resigned his position March 1. He has been connected with the company from 1899, the date of its organization, when it took over the Muncie Iron & Steel Company, of which Mr. Hanley was superintendent and a stockholder. He expects to enter the iron business again in the near future.

L. I. Ward, for several years division master mechanic for the American Sheet Steel Company and for the past year general manager of the National Gear Shield Company, Columbus, Ohio, has severed his connection with the last named company and has been appointed general manager of the A. Beyer Electric Company, New Philadelphia, Ohio.

John Reis of Newcastle, Pa., for some years district manager of the steel plants of the Carnegie Steel Company at New Castle, Sharon and South Sharon, Pa., has been appointed assistant to President W. E. Corey of the United States Steel Corporation. The position is a new one, created for Mr. Reis at the request of President Corey. He will more particularly take charge of new construction and improvements.

New South Wales Agitated Over the Locomotive Question.—A newspaper controversy is going on in Sydney, New South Wales, over the acceptance by the New South Wales Railway Commissioners of the tender of the Baldwin Locomotive Works, Philadelphia, for the manufacture of 20 engines. The desire of the New South Wales Government was to have these locomotives manufactured locally, but it appears that after making allowances for customs duties, &c., the Baldwin tender is still over $6000 per engine cheaper than the locally made article. The commissioners, therefore, do not feel justified in accepting the tender of James Martin & Co. of South Australia, the firm that put in the lowest local quotation. As to whether it is worth while to pay more for locomotives and other articles in order that Australia may in the future build up a home market for the producers is a matter on which the newspaper controversy is strong.

Street and Electric Railway Census.

The Bureau of the Census has just published an exhaustive report on street and electric railways for the year ending June 30, 1902, prepared under the supervision of W. M. Steuart, chief statistician for manufactures, by expert special agents, T. Commerford Martin of New York City and E. Dana Durand of the Bureau of Corporations. The text discusses the development of the modern street railway system, the generation and distribution of electric current, car equipment and a variety of other features upon which the technical efficiency and economy of the street railway service depend. It also treats of methods of installing and operating interurban systems, handling passengers, freight, mail, express, &c. Statistics are presented showing the growth of mileage and traffic and the effect of development upon the distribution of the population.

Among the other subjects considered are capitalization, relation of expenditures to receipts, general financial results, terms of franchise, rates of fare, accidents, safety appliances and the wages and conditions of labor.

In view of the movement to abolish overhead wires in the large cities, the success of the open conduit system, which has been introduced in the more populous parts of New York and Washington, is worthy of note. In 1902 the number of miles operated by this system in these cities was 264.

Increase in Mileage.

During the 12 years from 1890 to 1902 the total single track mileage for street and electric railways increased from 8123 to 22,577. This increase was due partly to the establishment of new railways, but principally to the extension of the lines already existing.

The mileage of the electric lines increased from 1262 to 21,907, while there was a decrease for the lines operated by other motive power, the decrease being from 488 to 241 miles for cable lines, from 711 to 170 miles for steam lines and from 5662 to 259 miles for lines using animals for their motive power.

In proportion to its area Massachusetts has much more electric railway mileage than any other State.

Cars.

There were 66,784 cars of all classes in the United States in 1902. Of this number 60,290 were passenger cars and 6494 were cars used for express and other purposes. Of the passenger cars 32,658 were closed, 24,259 were open and 3134 were combination closed and open cars, while 239 were combination passenger and express cars. There were 1114 cars devoted solely to express, freight and mail business.

Competition with Steam Roads.

Considerable competition has arisen between the steam roads and the electric interurban lines. While the steam roads have the advantage of greater speed, the frequent service, convenient stops and low fares of the electric roads have in many instances seriously affected the local traffic of steam railways. Statistics show that in 1902 the street and electric lines of the United States carried more than seven times as many fare passengers as the steam railways. Such a comparison, however, means little, since steam railway journeys are as a rule much longer than those on street railways. The receipts from passengers were $392,963,248 for steam railways and $233,821,548 for street railways.

In 1902 the passenger earnings of the street railways were 94.5 per cent. of the total receipts; the remainder of the revenue was derived from the sale of electric current, from freight, mail and express service, and from advertising and other miscellaneous sources.

Employees, Salaries and Wages.

The average number of salaried officials and clerks employed by the street railway companies of the United States in 1902 was 7128 and the average number of wage earners was 133,641. The salaries paid amounted to $7,439,716, and the wages to $80,770,449. The wages alone formed 56.8 per cent. of the total operating expenses of the street railway companies.

The highest wages were reported in Montana and the lowest in Alabama, Arkansas, Georgia, North Carolina and Tennessee.

Accidents.

The accident statistics show that during the year 1218 persons were killed and 47,429 were injured by street railway lines. One passenger was killed for every 18,015,894 fare passengers carried, and one was injured for every 178,876 passengers. The rate of accident for the wage earners was one killed out of 1095 and one injured out of 36. This rate is very much lower than the rate for steam railroads, for which one employee out of every 401 was killed and one out of every 24 was injured.

The reform in the direction of safety provisions for steam railway crossings has of late years been quite considerable in all large American cities, and has been carried on at an enormous expense, so that of the steam railway crossings now unprotected a large proportion are to be found in rural districts. The report states that in 1902 there were 4481 crossings, of which more than half were protected; 1967, however, were still without any form of protection, not even being supplied with bells or watchmen.

Effect on the Distribution of Population.

It is apparent to every one that the electric street railway is exerting a most important and beneficial effect on the territorial distribution of urban population, relieving the congestion in the centers of great cities and permitting growth far out into a belt of country which before the days of the trolley was inaccessible territory. Probably the possibilities which this new method of transportation introduces are only beginning to be realized.

Other Sociological Effects.

The presence of a rapid and cheap means of passenger transportation permits manufacturing and commercial establishments to be located conveniently and economically and allows the concentration of retail and wholesale trade and office business in specialized centers.

The change thus noted has had a marked influence upon the value of land, and upon rentals and building operations, for every extension of an electric railway line into new territory increases the selling and rental values of the real estate in the vicinity. Thus the clearly marked effect upon the community of the increase of electric railway facilities is to prevent overcrowding and to promote equalization of values.

The World's Coal Production.

Statistics received by the Department of Commerce and Labor, through its Bureau of Statistics, indicate that the world's output of coal in 1903 was 864,000,000 gross tons, of which the United States produced 319,000,000 tons, as against 230,000,000 produced by Great Britain, 160,000,000 by Germany, 39,000,000 by Austria-Hungary and 35,000,000 by France.

The world's growth in coal production is naturally coincident with its growth in commerce. From 1800 to 1850 the production was relatively small, and only increased from 11,500,000 tons at the beginning of the century to 81,000,000 in 1850, since which year there has been a marked increase. Coal production has in the last half century increased tenfold.

The rapid growth in the world's production is even surpassed by the record of the United States. In 1870, when the world's coal production amounted to 213,000,000 tons, the United States supplied but 33,000,000, or about 15 per cent. of the whole, being exceeded by Great Britain with 110,000,000 tons and Germany with over 33,000,000. In 1903 the United States, the United Kingdom and Germany supplied four-fifths of the world's coal product, the United States alone contributing 37 per cent. The following table shows the world's production of coal and the share supplied by the United States, at quinquennial periods, from 1870 to 1900, and annually from 1900 to 1903:

Years.	World's production. Million tons.	Produced by United States. Total. Million tons.	Per cent.
1870	213.1	32.9	15.4
1875	275.4	46.7	17.0
1880	330.3	68.0	20.6
1885	399.8	99.2	24.8
1890	503.3	140.9	28.0
1895	575.1	172.4	30.0
1900	755.4	240.8	31.9
1901	777.4	261.9	33.7
1902	788.9	269.3	33.9
1903	864.1	319.1	36.9

Of this enormous output of 319,000,000 tons by the United States, practically the entire amount is con-

sumed in the domestic market, as our exports of coal have never exceeded more than 3 per cent. of the total product of a single year.

OBITUARY.

EUGENE F. PHILLIPS.

Brief notice was given in a previous issue of the death of Eugene F. Phillips, founder of the American Electrical Works, Phillipsdale, R. I., which occurred February 22 from heart failure as he was recovering from an attack of pneumonia. Herewith a recent portrait of Mr. Phillips is presented. He was born in Providence, R. I., November 10, 1843, and was therefore 61 years of age. He was attending the Providence High School when the Civil War broke out and with other students enlisted in the Tenth Rhode Island Regiment, returning after completing his term of service to finish the course of studies. Engaging in different lines of business, among which was banking, in 1870 he began to

EUGENE F. PHILLIPS.

manufacture insulated telegraph wire in a very small way, in a shed in the rear of his home. This was the beginning of an industry which has grown to such proportions as to stand to-day as one of the largest wire manufacturing establishments in the world. His first plant of any size was at the corner of Stewart and Conduit streets, and in 1890 the greater part of the whole square in the same location was utilized for a new factory which was built for the purpose of accommodating the needs of the American Electrical Works, which was the name under which his enterprise had been incorporated.

The business grew so rapidly that in 1893 Mr. Phillips purchased the location on the Seekonk River, on which at the time stood the mill of the Richmond Paper Company, and in this he made repairs and alterations such as were necessary for the manufacture of wire. The immense establishment which was soon in operation furnished the neighborhood with such an amount of business that the village was named Phillipsdale in his honor.

Mr. Phillips also established a plant in Montreal in 1889, and it is at the present time the largest of its sort in the Dominion.

Although Mr. Phillips had been engaged in the copper branch of the wire trade from 1870 he did not enter the steel trade until 1899, when he became an officer of the Washburn Wire Company, serving as president of that company for the past two years. He is survived by a widow, two sons and a daughter. One son, Frank F., is president of the American Electrical Works.

NOTES.

RICHARD A. TURNOR of New York, who at one time was widely known throughout the Hardware trade of the United States, died of heart failure March 7, aged 60 years. He was born in England, but had lived in this country over 40 years. He was for many years connected with Asline Ward, agent for George Wostenholm & Sons, and in that capacity regularly visited the leading cities of the country making sales of Cutlery. For the past few years he has been connected with his brother, Thomas Turnor, 21 Cortlandt street, New York, in the railroad supply trade.

WILLIAM ROTH, vice-president of Roth Brothers & Co., builders of electric motors, Chicago, committed suicide March 10 while despondent over continued illness and business reverses. He was 40 years old.

ALEXANDER VAUGHAN, president of the Vaughan & Bushnell Mfg. Company, Chicago, died March 9, at the age of 80 years. He was born in the State of New York, went to Amboy, Ill., in 1847 as a machinist for the Illinois Central Railroad, and in 1862 engaged in the manufacture of hardware in Chicago, forming the above named firm, of which he has ever since been the head. He leaves a son, Sanford F. Vaughan, and two daughters.

The Steam Turbine Outlook in Marine Work.

An opinion of authority in regard to the future of the steam turbine, particularly in its application to the propelling of vessels, was given in the presidential address of C. A. Parsons before the Institute of Marine Engineers (Great Britain). The title of the paper was "The Past, Present and Probable Future of the Marine Engine," and in it the author stated that the triple or quadruple expansion engine of the present day has an expansive ratio of 5½ to 1 in battle ships to 25 to 1 in economical mercantile vessels, whereas the steam turbine is capable of expanding the steam received from the boiler right down to the condenser pressure. In support of his contention that it can do so efficiently he cited a recent test on the third-class cruiser Amethyst when the turbine showed its power of utilizing a high ratio of expansion at all speeds, by beating the reciprocating engine in economy at all speeds, and at the highest powers, by as much as 40 per cent. in coal per horsepower.

Mr. Parsons thought that it was safe to predict that the turbine will soon supersede the reciprocating engine in vessels of 16 knots sea speed and upward and of over 5000 indicated horse-power. It will also probably be used for vessels of speeds down to 13 knots and of 2000 tons and upward, and possibly also in even slower vessels, in course of time. At present it might, he thought, be said that the most suitable field comprises about one-fifth of the total steam tonnage of the world. It must be remembered, however, that the speed of ships tends to increase, and the turbine to improve; thus the class of vessels for which the turbine is suitable will increase. It seems probable also that a combination of the reciprocating engine and the turbine will be found the best machinery for vessels of the tramp class in the immediate future. That field is a very large and important one and deserves more attention than it has as yet received.

The main feature of this combination of machinery is, he said, that the full measure of expansion essential to economy can be obtained. Attention was drawn to the fact that if the indicator cards of a tramp steamer were examined, it would be found that the steam is usually expanded down to about 7 pounds pressure absolute, and that it is then released into the condenser, and that the remaining energy—between 7 pounds down to, say, 1½ pounds, or 27-inch vacuum—was almost entirely lost. The turbine is able to save 70 per cent. of that wasted power and apply it to help in driving the vessel. The additional power gained by use of a low pressure turbine has been calculated as between 15 and 20 per cent. of the whole now realized—a gain of the same order as was obtained in the advance from the compound to the triple engine. Mr. Parsons concluded by saying that in these days of rapid advance it is of the highest importance that engineers should be well versed in the machinery under their charge, and also have as much knowledge as possible of the general principles upon which the design is based. They will then, he contended, be in a position not only to get the best results from their engines, but also to afford the most valuable assistance to the designers and constructors of machinery.

NEWS OF THE WORKS.

Iron and Steel.

The American Rolling Mill Corporation, with offices at Chicago and mills at Muncie, Ind., has issued $100,000 in ten-year first mortgage bonds on its rolling mill machinery and real estate at Muncie. This was done to clean up the company's indebtedness and give additional working capital.

The Helen Furnace, Clarksville, Tenn., owned by the Red River Iron Company, went into blast March 9, after having been closed down for a year. The furnace uses coke for fuel and produces about 150 tons of pig iron a day. Hickman & Williams, The Rookery, Chicago, are Western sales agents.

The transfer of the Star and Monongahela plants of the American Tin Plate Company to the American Sheet & Tin Plate Company has been recorded at the county recorder's office in Pittsburgh, the consideration named in the deeds being $1. The two concerns were merged into the American Sheet & Tin Plate Company on January 1, 1904.

The Cranberry Furnace Company, Johnson City, Tenn., which has for the past three years operated Carnegie Furnace at that place, producing low phosphorus pig iron from ore from the Cranberry mine, has purchased the stack from the Virginia Iron, Coal & Coke Company. The gentlemen interested in the furnace company are all interested in the Cranberry Iron & Coal Company, which owns the Cranberry mine, and the company will continue under an arrangement that it has with the Cranberry Iron & Coal Company for the operation of the Cranberry mine.

Definite plans have been made by the Youngstown Iron Sheet & Tube Company, at Youngstown, Ohio, for the building of a Bessemer steel plant. A meeting of the directors of this concern was held in Youngstown on Tuesday, March 14, at which the final details were arranged. The plant will be located near the present works of the Youngstown Iron Sheet & Tube Company, between Haselton and Struthers, Ohio, where the company owns a large plot of ground, having nearly 1 mile of railroad frontage. The initial plant will contain two 10-ton converters, and contracts for buildings and equipment will be ready for placing within a short time. The output will be Bessemer billets, sheet and tin bars, and the initial capacity will be from 1200 to 1500 tons a day.

The Reading Iron Company has stopped Emaus Furnace, at Emaus, Pa., for repairs. The stack and machinery will be overhauled.

The Thomas Iron Company is repairing its No. 7 furnace, at Lock Ridge, and it will be started this spring if needed.

The first of the furnaces of the Berkshire Iron Company to start at Sheridan, Pa., was No. 1 stack, which was lighted on Monday of this week.

General Machinery.

The Kingsland-Kay-Cook Mfg. Company, St. Louis, Mo., recently incorporated with a capital stock of $120,000, has purchased the plants of the Central Union Brass Company, Kay-Pim Mfg. Company and the Kingsland Foundry Company, which will be consolidated and operated. The company will manufacture iron and brass castings, power transmitting, elevating and conveying machinery. No new equipment will be required for the present, as the company has two machine shops completely equipped with up to date tools.

During the month of February the A. S. Cameron Steam Pump Works, New York, shipped a large number of its pumps to foreign countries, some of which went to the west coast of Africa, six pumps to Auckland, N. Z., special sinking and station pumps to Ste. Anonyme des Mines d'Or de Territo, Brazil; Cia Mina de Penolis, Mapimi, Mexico; Webbwood, Ont., and Pilling Island, Canada. The company reports a good volume of orders and among the recent installations were several pumps for the Delaware, Lackawanna & Western Railroad at points in New Jersey; Western Tube Company, Kewanee, Ill.; McClung & Co., Knoxville, Tenn.; Roy & Titcomb, Nogales, Ariz.; Oil Well Supply Company, Bradford, Pa.; Griffiths & Nathaniels, Poultney, Vt.; Granville Die & Machine Works, Granville, N. Y.; New Suddy Coal Company, Tennessee; Hullock Milling Company, Hullock, Md., and Department of Water Supply, Alexandria, Ind.

The Utility Mfg. Company, Sturgis, Mich., has purchased of Shoecraft & Allard the factory building on North street which it has been occupying, increasing its facilities for the manufacture of corn poppers. It has a line of equipment furnished by the Niagara Machine & Tool Company. The company is now in the market for a two-wheel emery arbor with standard and countershaft, and a double crank press for medium weight work, either new or second-hand if in good condition.

The James Smith Woolen Machinery Company, Philadelphia, Pa., has sold its plant to Stephen F. Whitman & Son, and will occupy a new plant as soon as the location can be determined upon. The company did not sell any of its machinery or other equipment except the engine, boiler and shafting, which go with the building, and it is likely that as soon as the company is ready to equip its new building practically no new machinery will be required with the exception of the power plant equipment.

The New Jersey Zinc Company and the Mineral Point Zinc Company, now practically one concern, Marquette Building, Chicago, are making rapid progress in their new reduction plant at Depue, Ill. Contracts have been let to Wells Bros., Chicago, for the erection of two large buildings, in addition to the pottery building which was mentioned previously in these columns. The power building is to be 38 x 100 feet, one story high. The engine and boiler room will be spanned by an electric traveling crane. The chemical building, three stories in hight, will have a ground area of 135 x 160 feet. Depue is only six miles distant from the zinc plants at Peru and La Salle, and enjoys all their advantage of cheap fuel and favorable freight rates. Boilers, engines and other machinery have not yet been purchased.

Pawling & Harnischfeger, manufacturers of cranes at Milwaukee, Wis., expect to have their offices at the new plant west of the city ready for occupancy soon after April 1. Most of the manufacturing of the company is now being done at the new works.

The Rome Locomotive Works, Rome, N. Y., has increased its capital stock from $150,000 to $350,000.

The Leader Works, Decatur, Ill., is erecting a boiler and machine shop, which will be 52 x 176 feet. The company has practically all the tools and machinery which will be required for the equipment of this shop. The Leader Works builds brick and tile machinery, engines, boilers, tanks and the like.

The Polson Iron Works, engineer, boiler maker and steel ship builder, Toronto, Ont., was recently incorporated. The office and works are at Esplanade East, Piers 36 and 37.

J. S. Gaffga & Co., Greenport, N. Y., have erected a new machine shop for building the Gaffga motors, for which the firm has a number of orders on hand. Later on the company will probably need some more machinery, such as lathes, millers, drills, &c., and is at the present time in the market for a small stationary gasoline engine of from 5 to 10 horse-power.

The Buffalo Steam Pump Company, Buffalo, N. Y., has recently received orders for several additional pumps from the Ingersoll-Sergeant Drill Company for the compressed air equipment at the New York East River tunnel, also orders for three Underwriter fire pumps, built according to 1904 specifications, one each for the Waiontha Knitting Company, Richfield Springs, N. Y.; Ontario Knitting Company, Oswego, N. Y., and the Auburn Hame Company, Auburn, N. Y. The company has on hand a large number of export orders, including pumps for Brazil, Sydney, N. S. W.; Cuba and the Philippines.

Aside from a 50 horse-power Corliss or automatic engine, which is about decided upon, the only machinery that will be required by the Reading Radiator Company, Reading, Pa., for equipping its new shop will be of special character and must be constructed under the direct supervision of the company. The other equipment will be taken from the old shop, which will be used hereafter for warehouse purposes.

John A. Morris, Wilmington, N. C., has opened a machine shop at 212 Market street, where he will do general machinery work and pattern making.

R. G. Terry and Charles E. Jones, the latter late superintendent of the Glamorgan Pipe & Foundry Company, have organized the Jones-Terry Foundry & Machine Company and will shortly establish a foundry and machine shop at Lynchburg, Va.

The A. Beyer Electric Company, New Philadelphia, Ohio, will install in the near future one 500 horse-power open feed water heater, mechanical stokers, new rope transmission and many other devices, which are expected to make the efficiency of the plant second to none in the country.

The H. K. Porter Company, Pittsburgh, builder of light locomotives, has secured a contract for a number of locomotives for the new railroad being built in British Zanzibar.

Bridges and Buildings.

The 1905 budget for the city of Chicago provides for an expenditure of $1,830,000 for bridges. This includes a lift bridge at Archer avenue, which is now being built; one at North avenue on which plans are completed, and will allow for the construction during this year of rolling lift bridges at Indiana street, North Halsted street and Chicago avenue. During the year it is expected that lift bridges will be begun at least for Erie street and Kinzie street. There will be completed this year a pontoon across the Calumet River at Torrence avenue. The old Eighteenth street bridge, which now spans a slip at Twenty-second street, will be removed to Southwestern avenue, where a new substructure will be installed.

The city of Manistee, Mich., will receive proposals until March 30 for removing the present drawbridge and building a new one over Manistee River. G. B. Pike is city engineer.

The Columbus Structural Steel Company has been organized at Columbus, Ohio, for the purpose of fabricating structural steel, but not to engage in the rolling of material. While the company has not yet secured a site it expects to do so very soon and to be in a position to put material on the market within a short time.

The Cincinnati Southern Railroad, because of the purposed double tracking of its road from Erlanger, Ky., to Cincinnati, Ohio, will change its two bridges near Erlanger to double track

steel structures at a cost of about $350,000. G. B. Nicholson, the chief engineer, Cincinnati, Ohio, writes that bids will soon be received on this work.

The Baltimore & Ohio Railroad Company will replace the timber trestle across the Okaw River, near Springfield, Ill., by a steel bridge which will be 815 feet long and cost about $80,000. The work will be done by division forces.

The Hennepin Bridge Company has incorporated at Minneapolis, Minn. The capital stock is $100,000 and the incorporators are Lawrence H. Johnson, Frank H. Howe, Wm. W. Roberts, Thorvald M. Thomson and Charles J. Traxler. These gentlemen also constitute the first Board of Directors. Mr. Johnson, the president of the company, writes that the company has been doing business for a number of years, mostly of a contracting nature, although it has been building structural iron work in a small way. It is probable that a plant will be erected in the near future for the building of structural material.

The American Bridge Company is doing considerable structural work in the vicinity of Cincinnati, Ohio. It has the contract for the L. & N. extension to the Newport and Cincinnati Bridge extending about 1000 feet and which will consume about 3000 tons of iron, also the viaduct connecting the C. & O. Railroad with the C., H. & D. Railroad, consisting of 1500 tons. It also has contracts for the erection of several bridges along the line of the C., H. & D. Railroad that will consume in the neighborhood of 5000 tons.

The McClintic-Marshall Construction Company, Pittsburgh, with works at Rankin and Pottstown, Pa., has received a contract for the steel buildings for an extension to the open hearth plant of the Alan Wood Company, at Conshohocken, Pa., that will require about 1500 tons of steel. This concern also has a contract for the steel frame work for the new forging plant of the Crescent Forgings Company, at Hulton, Pa., comprising forging and machine shops, power house, warehouse and crane runway, requiring about 500 tons of steel; also several other contracts for structural work involving 2000 tons or more of steel.

Foundries.

Warren Heaton, Neosho, Mo., has purchased the foundry and machine works in that city from J. A. Rogers. The plant was established in 1879 by Van Riper & Rogers, and in 1896 Mr. Rogers purchased the interest of Mr. Van Riper. Mr. Rogers has removed to Joplin, Mo., where he will look after the business of the Rogers-Conklin Mfg. Company, engineer, founder and machinist, of which he is president.

The Herron Pump & Foundry Company, Chattanooga, Tenn., will increase its capital stock from $100,000 to $150,000. The company has secured a large contract for furnishing valves and hydrants to the Panama Canal Commission.

The foundry formerly conducted by the G. M. Emeny Company, known as the Fulton Foundry & Machine Works, Fulton, N. Y., has discontinued business, and the foundry supplies on hand, such as molding sand, ladles, flasks, &c., have been purchased by the Dilts Machine Works of the same city, which has recently increased the capacity of its foundry by the installation of a larger cupola and additional floor space, thereby placing itself in an excellent position to take care of the increase to its business.

A serious fire occurred recently at the plant of the Hardie-Tynes Company, Birmingham, Ala., involving the loss of the foundry part of its plant and resulting in damage to the works of about $25,000. The foundry will have to be rebuilt from foundation to capstone, and practically new machinery will have to be installed to replace that destroyed or too badly damaged for further use. All that saved the entire plant from destruction was the fact that in its erection the principle of isolation of each part from the others was carried out as far as practicable. The work of rebuilding will commence as soon as possible, and that means as soon as insurance losses are determined. The loss is covered by insurance, and the inconvenience attendant upon the fire will be but temporary.

Peacocks' Iron Works, Selma, Ala., having outgrown its present quarters, is seeking a site advantageously located where it can erect a plant with three times the capacity of its present works. The company has been located at the present address for many years, and is well known both in this and foreign countries. A specialty is made of the manufacture of car wheels and cars of all sizes and kinds, in addition to which a general iron business is done, also the manufacture of stationary engines, saw mills and other machinery.

The new molding and machine shops are to be erected by Abendroth Brothers, New York, at its plant at Port Chester, N. Y., and not at Newburgh, as was stated in these columns last week.

Power Plant Equipment.

The W. A. Heath Machine Company, Lestershire, N. Y., has begun the manufacture of a new gasoline engine, the invention of W. A. Heath. In addition to gasoline engines the company will also build motor boats.

The Harrington-Wiard Company, recently organized, has taken over the old works of N. B. Harrington & Co., at Buffalo, N. Y., and will move the business to Batavia, N. Y., about May 1, where it has rented quarters. In the near future the company expects to erect a building of its own. The products will be single cylinder four-cycle gasoline motors up to 50 horse-power and experimental machinery. N. B. Harrington is president; J. W. Pratt, vice-president, and F. Wiard, secretary and treasurer.

The Toledo Interurban Construction Company has recently awarded to the Allis-Chalmers Company the contract for the complete equipment of the new power house of the Toledo, Port Clinton & Lake Side Railway at Port Clinton, Ohio, including two 1280 horse-power Reynolds Corliss engines, two 800-kw. Bullock alternating current generators, two 50-kw. Bullock direct current generators, one 400-kw. Bullock alternating current rotary converter, two Tomlinson barometric condensers, and boilers, pumps, heaters, &c.

The Pilling Air Engine Works, Detroit, Mich., having gone out of existence by limitation, has been succeeded by the Pilling Air Engine Company and the following officers have been elected: J. C. Fleming, president; F. L. Bromley, secretary and treasurer, and J. L. Pilling, vice-president and general manager.

Fires.

Fire wrought about $7500 damage to the foundry department of the Barcus Mfg. Company, Wabash, Ind.

Fire destroyed the annealing building of the Missouri Malleable Iron Company, East St. Louis, Ill., on the 7th inst., causing a loss of about $35,000, of which $30,000 is covered by insurance. The ovens were but slightly damaged and a temporary shelter will be built and utilized until the building can be replaced. The company expected to be in operation very near to full capacity before this week was past.

The Enterprise Works of the Pennsylvania Glass Sand Company, at Vineyard Station, near Lewistown, Pa., were burned March 9, the loss amounting to $16,000.

On March 10 the factory of the Sagel Candy Mfg. Company, at Vineland, N. J., was burned, the loss aggregating about $50,000.

The Lake Side Malleable Iron Works, at Lake Side, Wis., were recently destroyed by fire. The loss is placed at $30,000.

The Bovee Grinder & Furnace Works, at Waterloo, Iowa, were recently destroyed by fire. The loss is about $15,000.

The John W. Johnson Machine Works, Upper Sandusky, Ohio, were recently burned, the loss amounting to about $10,000.

The machine shop and boiler house of the Maryland Rail Company, South Cumberland, Md., were recently destroyed by fire. The main buildings of the plant were saved.

The strawboard paper mills of John Leggett & Son, at Middle Grove, near Ballston, N. Y., were destroyed by fire March 13. The loss is placed at $50,000.

Hardware.

The Archer Fence Company, South Bend, Ind., is erecting a new factory building, 64 x 128 feet, which it expects to occupy about April 1. The present quarters of the company are too small, and this, coupled with the fact that first-class railroad facilities will be secured at the new location, is responsible for the change.

The Westlake Construction Company, Nashville, Tenn., which has the general contract for the erection of the 12-story First National Bank building, has sublet the following contracts: Hardware, J. H. Fall & Co., Nashville; elevators, Otis Elevator Company, Chicago; boilers, John O'Brien, St. Louis; electrical machinery, Northern Electric Company, Madison, Wis.

The Michigan Wire Cloth Company, Detroit, Mich., is contemplating the enlargement of its plant by the erection of an additional brick building, to be 150 x 200 feet.

We have been advised by the New Castle Stamping Company, New Castle, Pa., manufacturer of enameled ware, that business has been so brisk since the first of the year that the company has been compelled to run 24 hours per day. The company is now contemplating the erection of additional buildings sufficient to increase the output threefold.

Miscellaneous.

The Hewitt Rubber Company, Buffalo, N. Y., capitalized at $500,000, has broken ground for the first two buildings of its plant, located on the New York Central Belt Line at Kensington avenue. The plant when completed will consist of a power house, 60 x 60 feet; two one-story buildings, each 60 x 200 feet; one three-story building, 100 x 500 feet, and a warehouse, 90 x 200 feet, all to be of strictly fire proof construction. The plant when completed and fully equipped will cost about $300,000. The product of the plant will be air brake, steam and water hose, manufactured under a patented process, and mechanical rubber in its various commercial forms. The president of the new company is H. H. Hewitt, who is also president of the Magnus Metal Company. The plant will be electrically equipped and operated by Niagara Falls power.

The Standard Scale & Supply Company, Pittsburgh, with works at Beaver Falls, Pa., has recently secured a number of Government orders for installation of its scales at the navy yards at League Island, Brooklyn and Norfolk, Va. During 1904 the export trade of this concern in its scales has been an important feature, large shipments having been made to Mexico, Central and South America.

Cheney Bros., silk manufacturers, South Manchester, Conn., are considering a plan for either remodeling their present carpenter shop or the building of a new one. They state that it is not probable that they will require much in the way of new machinery, as they already have nearly everything they need.

The General Pneumatic Transit Company has been incorporated at Trenton, N. J., with a capital stock of $30,000,000. It is understood that the company represents a consolidation of pneumatic tube interests in New York and Philadelphia, and that it has a working arrangement with British and Foreign Tube Syndicate of London.

The Sanitary Can Company, New York, has incorporated with a capital stock of $150,000 and will operate the plant recently erected by the Max Ams Machine Company and which was described in *The Iron Age* some months ago. The office of the company is at 372 Greenwich street.

The Nazareth Portland Cement Company, Nazareth, Pa., is making arrangements to double the capacity of its mills, the intention being to increase the output to 3000 barrels per day. As plans are not completed the company is not yet ready to receive bids for the construction of the additional buildings.

The Indiana Iron & Metal Company is the name of a new firm at South Bend, Ind., organized to deal in old materials. Herman T. Cohen, for eight years connected with his father in the merchandise business, is proprietor of the new firm. Yards have been fitted up on St. Joseph street.

The Ohio Fuel Supply Company, Columbus, Ohio, has closed contracts with the Ohio Malleable Iron Company, Kilbourne & Jacobs Company and the State hospital to furnish them with gas. The companies and the institution have heretofore been using coal, consuming about 40,000 tons annually. The price is understood to be in the neighborhood of 12 cents net. The Ohio Fuel Supply Company has decided to extend its mains to Dresden, Frazersburg and Trinway, Muskingum County, as soon as weather conditions permit, and this will necessitate the laying of a line about 11 miles long. The company is now surveying for the proposed line between Columbus and Cincinnati, via Xenia, the survey being completed as far as the latter place. The company's officials feel reasonably sure of building the line through to Cincinnati, though there is a possibility that the line may be diverted in other directions from Xenia and Cincinnati supplied from the company's properties in West Virginia.

The Union Wire Mattress Company, Erie and Sedgwick streets, Chicago, has leased and will remove to the large plant on Goose Island formerly occupied by the Ames & Frost Company. The lease is for ten years at a total rental of $120,000. The plant consists of a group of buildings comprising more than 130,000 feet of floor space. The property was leased by the Pope Mfg. Company.

Charles Mundt & Sons, New York, makers of perforated brass, tin, copper, steel, zinc, &c., have recently installed considerable new machinery to increase their production. With the enlarged facilities they are now in a position to make anything in the perforated metal screen line that may be required.

A company at the head of which is the firm of Sweet & Doyle, Cohoes, N. Y., is equipping a plant at Troy, N. Y., for the manufacture of the Sweet & Doyle gate and globe valves in both brass and iron. The plant will be equipped with modern machinery for the special line of manufacture, and it is expected that it will be in operation by the first of April.

The organization of the King-Lawson Car Company, Middletown, Pa., has been completed by the election of Thomas Lawson of New York president and general manager; Theodore Thomas of New York, vice-president; Arthur King of Middletown, treasurer, and Paul A. Kunkel of Harrisburg, secretary. The company will put on the market the newly patented King-Lawson dump car, which is operated by compressed air, and has entered into a contract with the Middletown Car Works for the construction of its cars.

The Huntington Piano Company, Derby Conn., is to erect an addition to its factory 40 x 97 feet and five stories. No additional power equipment will be needed.

The Union Fabric Company, Ansonia, Conn., is to erect an addition, which will be two stories, 40 x 97 feet, and one story, 34 x 88 feet.

The Kinnear Hood Steel Company, New York, manufacturer of pressed steel radiators, has been succeeded by the Kinnear Pressed Radiator Company. The company is building a new plant in West Pittsburgh.

During the past month the Williams Electric Machine Company, Akron, Ohio, has made a large number of sales of its magnetic clutches, orders being received from a State university, brass rolling mill, engraving company and a large clay manufacturing company. These orders show a diversified application of the magnetic clutches.

Contracts have been let for repairs to the plant of the Bay State Belting Company, Boston, Mass., which was recently damaged by fire. No new machinery is required.

The Columbus Heating & Ventilating Company, Columbus, Ohio, formerly the Vogelsgesang Furnace Company, has decided to erect a new plant. The plans call for a two-story brick building 120 x 190 feet

The Department of Public Works, Detroit, Mich., will receive sealed proposals until March 31 for the erection of a plant for the manufacture of paving brick. The specifications call for a plant of from 20,000 to 30,000 brick capacity daily.

The Waterbury Electric Company, Waterbury, Conn., has been reorganized and incorporated, and is located at 48 Jefferson street, Waterbury. The company will manufacture thermostats, heating and gas regulators, clock movements for special purposes, small novelties in brass, iron and steel and small gears, &c. No machinery will be purchased at present.

Pacific Coast Prospects.

SAN FRANCISCO, CAL., March 4, 1905.—The magnitude of the transit trade between Eastern manufacturing centers and Japan during the past year has at last attracted the attention of Eastern capitalists who have examined somewhat closely into the facilities for manufacturing iron and steel and their various products on the bay of San Francisco, with the result that Eastern capital may be invested in California industries of this character during the next couple of years.

The events which have led to this are closely connected with the fight that has long been carried on in this city between the old gas company, known as the San Francisco Gas & Electric Company, and its various competitors. These have been quite numerous. About a year ago the old company thought that it was at last master of the field, as it had bought out its principal competitor, Claus Spreckels, the owner of the independent plant, who started the fight on account of some differences with the manager of the gas company. But the San Francisco Coke & Gas Company, which was started to manufacture coke by the Lowe process, failed of success. It succeeded in manufacturing coke, but the business did not pay, and it only kept afloat by selling gas, a by-product of the plant, to the old company. This it did at 30 cents per 1000 cubic feet, while the old company got $1 for it. The new company thought that it was entitled to a little more out of the $1, but the old company refused to advance this price. Meanwhile, those connected with it had interested Leopold Michaels, a business man and capitalist of this city, who had the ear of New York capitalists, among them those represented by Jacob Schiff, acting for Kuhn, Loeb & Co. Mr. Schiff came out here to examine the Southern Pacific road and incidentally other matters of a financial nature. He became convinced that a new gas company could live and pay profits out of 75 cents per 1000 feet, and so the raising of $5,000,000, one-half already secured by means of bonds, was a good proposition. His attention was also directed to the facilities for the manufacture of iron and steel on the shores of this bay, with the result that some of the larger capitalists of New York City have projected the establishment of great industries here. Electric power will be used. It is stated by those interested that San Francisco should be one of the important manufacturing centers of the world, having the advantage of proximity to the markets of China, Japan, Australia, Mexico and Central and South America. One result of the gas fight has been the benefiting of the Eastern manufacturer by a pretty big order for pipe—36 miles at the start, of which half is either here or on the way, while the other half is in preparation for shipment.

The coast wire business, especially in this State, is growing fast, as the population has increased largely during the past year, and a great deal of barb wire is used for fencing, as well as wire cable for street car lines and for hauling logs from the logging camps to the railroads or to water transportation, whence they can be shipped to the mill. But the business is divided up between two companies instead of one. The younger has been making great strides during the last two years. In this connection it may be well to state that the lumber business this year will show a large increase over the last, and that several new mills will be put up in the redwood and sugar and white pine sections, which will require a large outlay of money for machinery and supplies.

A boat for artillery service in this harbor will be built on the coast. J. O. L.

The Iron and Metal Trades

The outlook continues very cheerful in all directions. Considering the very heavy tonnage placed earlier in the year in Pig Iron, the buying has been very good in such widely distant points as New England and Chicago, Philadelphia and Cincinnati, and the market is firmer. This is particularly true of New England, where the announcement of an advance of about 50c. in the prices of Buffalo Irons is to be specially noted, since that producing point has been relatively low in that particular territory. There are some interesting movements under way in Bessemer Pig in the Central West which may exert a considerable influence in the Steel trade. The Steel Corporation has not yet determined whether an additional purchase of 10,000 tons for this month will be required. It is estimated that 40,000 tons of outside Pig will be needed for April. The Corporation is now operating 96.2 per cent. of its blast furnace capacity. To the Eastern merchant furnaces the plan of starting the Troy Works of the Steel Corporation is of special interest. No decision on this point has been reached.

In the Steel Rail trade the most striking event has been the closing of some important export orders. The United States Steel Corporation has contracted for the delivery of 25,000 tons of Standard Rails to the Buenos Aires & Southern Railroad, while the Maryland Steel Company is reported to have closed for about 18,000 tons for another South American railroad.

In one department of the Steel Rail trade, long very dormant, there has been a distinct revival recently, and that is in material for street railways. This covers both Girder Rails and special work.

The railroads continue to place liberal orders for rolling stock, and that is reacting very favorably upon Structural mills, Plate and Bar mills. It is noted also that the Steel Casting shops have been getting a good run of orders, and that prices in this branch have much improved during the past few months.

The market for Sheets is particularly strong, and there seems little doubt that an advance in prices will be established at an early date.

An increasing number of complaints come from widely different parts of the country about the difficulty of securing an adequate supply of suitable labor. Locally the labor situation is held accountable for a certain dullness which characterizes many branches of industry which consume Iron and Steel. It appears that work is being diverted to competitive districts.

A Comparison of Prices.

Advances Over the Previous Month in Heavy Type, Declines in Italics.

At date, one week, one month and one year previous.

	Mar.15, 1905.	Mar.8, 1905.	Feb.15, 1905.	Mar.16, 1904.
PIG IRON:				
Foundry Pig No. 2, Standard, Philadelphia	$17.50	$17.50	$17.50	$14.75
Foundry Pig No. 2, Southern, Cincinnati	16.25	16.25	16.25	12.25
Foundry Pig No. 2, Local, Chicago	17.50	17.50	17.50	14.00
Bessemer Pig, Pittsburgh	16.35	16.35	16.35	14.10
Gray Forge, Pittsburgh	16.00	16.00	16.00	13.25
Lake Superior Charcoal, Chicago	18.50	18.50	18.50	14.75
BILLETS, RAILS, &c.:				
Steel Billets, Pittsburgh	24.00	24.00	24.00	23.00
Steel Forging Billets, Pittsburgh	26.00	26.00	26.00	....
Steel Billets, Philadelphia	28.00	29.00	28.00	24.50
Steel Billets, Chicago	**28.00**	28.00	27.00	24.00
Wire Rods, Pittsburgh	**33.00**	31.50	31.00	31.00
Steel Rails, Heavy, Eastern Mill	28.00	28.00	28.00	28.00
OLD MATERIAL:				
O. Steel Rails, Chicago	*14.50*	14.50	15.50	12.50
O. Steel Rails, Philadelphia	18.00	18.00	18.00	14.00
O. Iron Rails, Chicago	*20.00*	19.50	20.50	16.50
O. Iron Rails, Philadelphia	**24.50**	23.00	23.00	17.00
O. Car Wheels, Chicago	*15.75*	15.75	16.25	14.50
O. Car Wheels, Philadelphia	**17.00**	16.00	16.00	13.00
Heavy Steel Scrap, Pittsburgh	16.00	16.00	16.00	14.00
Heavy Steel Scrap, Chicago	**14.50**	14.50	14.00	11.50
FINISHED IRON AND STEEL:				
Refined Iron Bars, Philadelphia	1.75	1.67½	1.73½	1.43½
Common Iron Bars, Chicago	*1.60*	1.60	1.65	1.50
Common Iron Bars, Pittsburgh	1.65	1.65	1.65	1.34⅜
Steel Bars, Tidewater	**1.64½**	1.64½	1.54½	1.49½
Steel Bars, Pittsburgh	**1.50**	1.50	1.40	1.35
Tank Plates, Tidewater	**1.74½**	1.74½	1.64½	1.74½
Tank Plates, Pittsburgh	**1.60**	1.60	1.50	1.60
Beams, Tidewater	**1.74½**	1.74½	1.64½	1.74½
Beams, Pittsburgh	**1.60**	1.60	1.50	1.60
Angles, Tidewater	**1.74½**	1.74½	1.64½	1.74½
Angles, Pittsburgh	**1.60**	1.60	1.50	1.60
Skelp, Grooved Steel, Pittsburgh	**1.65**	1.65	1.50	1.45
Skelp, Sheared Steel, Pittsburgh	**1.70**	1.70	1.55	1.50
Sheets, No. 27, Pittsburgh	2.20	2.20	2.20	2.20
Barb Wire, Pittsburgh	2.25	2.25	2.25	2.55
Wire Nails, Pittsburgh	1.80	1.80	1.80	1.90
Cut Nails, Pittsburgh	1.80	1.80	1.80	1.70
METALS:				
Copper, New York	15.25	15.25	15.25	12.50
Spelter, St. Louis	**6.05**	6.15	5.97½	4.80
Lead, New York	4.45	4.45	4.55	4.50
Lead, St. Louis	**4.37½**	4.35	4.35	4.45
Tin, New York	**29.37½**	28.50	29.25	27.25
Antimony, Hallett, New York	7.87½	7.87½	8.50	7.25
Nickel, New York	40.00	40.00	40.00	40.00
Tin Plate, Domestic, Bessemer, 100 pounds, New York	3.74	3.74	3.74	3.64

Chicago.

FISHER BUILDING, March 15, 1905.—(*By Telegraph.*)

The past week has been an uneventful one, with only a healthy volume of business transacted in both Pig Iron and Finished Iron and Steel products. Specifications on existing contracts have been sufficiently large to keep mills and furnaces fully occupied, and a fair volume of business for future delivery has been closed. Current pick up business exclusive of time contracts has been rather limited. About 20,000 tons of Pig Iron were sold in this market last week, of which about half was Southern Iron. Southern prices are firm on the basis of $13.50, Birmingham, with some sales made at higher prices. The Republic Iron & Steel Company has withdrawn from the Pig Iron market at $13.50, holding at $14, thus quoting on the same basis that the Tennessee Company has for a number of weeks. Others are expected to follow. Northern Iron is firm and strong at $17.50, though large contracts will demand a somewhat lower price. Both Northern and Southern furnaces are at variance on the matter of quoting for fourth quarter delivery, some refusing to quote prices beyond the third quarter. There is no relief in the Billet shortage, and the leading producer only the other day bought 1000 tons of Forging Billets from a local Open Hearth plant at a premium in order to fill its orders. The Illinois Steel Company has practically withdrawn from the market as a seller of Standard Section Rails, as it has

already booked 600,000 tons, which, in addition to the 100,000 tons carried over from last year's contracts, bring its rolling list so near its ultimate capacity of 725,000 tons that the company has withdrawn as an active factor in competitive markets. From this time on the office in the Rookery will, if the present programme is carried out, quote only on behalf of the Carnegie Steel Company, compelling the Western roads to pay freight from Pittsburgh on orders placed hereafter; or, in other words, quoting a price of $28, at Pittsburgh, instead of at Chicago. Plate mills are already so full of business that it is stated they are from 60 to 90 days behind their orders, and customers have to wait their turn. The same is true, though to a much less extent, with the Structural Steel mills. Specifications on Bars, Bands and Hoops are heavy and mills are unable to make satisfactory delivery in many cases on specifications. The Sheet situation is strong, with steadily increasing demand, and every prospect that prices will be officially advanced $2 a ton before long. These advances are made necessary by the increasing cost and scarcity of Sheet Bars. A lull has been experienced in the Pipe business, as jobbers' stocks are now taking care of current demand, and it will be some weeks before jobbers will be in the market again for large tonnages. The Boiler Tube market is active. Scrap prices are practically unchanged. Coke is in fairly active demand, but prices have not changed since a week ago.

Pig Iron.—Over 20,000 tons of Pig Iron were ordered during the week under review, an unexpectedly large tonnage of which was ordered for prompt delivery, while some of it was in the form of contracts for shipment during the balance of the present year. It is evident that the melt of Pig Iron is increasing in this market, and prices are firm. The Republic Iron & Steel Company has decided to withdraw from the market as a seller of Southern Iron at the $13.50 basis, holding for a minimum of $14, at Birmingham. This is the same stand that the Tennessee Company took more than a month ago. Other furnaces are expected to follow. Several orders for 1000 tons each were placed in this market, and what instructions are received by furnaces to hold shipments are fully counterbalanced by other instructions to anticipate shipments. There has been some little business done in Sheet Iron at full prices by brokers who were fortunate enough to have Iron on track. The situation is strong in spite of the comparatively light business done. We quote:

Lake Superior Charcoal	$18.50 to $19.00
Northern Coke Foundry, No. 1	18.00
Northern Coke Foundry, No. 2	17.50
Northern Coke Foundry, No. 3	17.00
Northern Scotch, No. 1	18.00 to 18.50
Ohio Strong Softeners, No. 1	19.30
Ohio Strong Softeners, No. 2	18.80
Southern Silvery, 4 to 6 per cent. Silicon	18.65 to 19.65
Southern Coke, No. 1	17.65 to 17.90
Southern Coke, No. 2	17.15 to 17.40
Southern Coke, No. 3	16.65 to 16.90
Southern Coke, No. 4	16.40 to 16.65
Southern Coke, No. 1 Soft	17.65 to 17.90
Southern Coke, No. 2 Soft	17.15 to 17.40
Southern Gray Forge	16.50 to 16.75
Southern Mottled and White	15.90 to 16.15
Malleable Bessemer	17.50
Standard Bessemer	18.50 to 19.00
Jackson County and Kentucky Silvery, 6 per cent. Silicon	21.30
Jackson County and Kentucky Silvery, 7 per cent. Silicon	21.80
Jackson County and Kentucky Silvery, 8 per cent. Silicon	22.30
Jackson County and Kentucky Silvery, 10 per cent. Silicon	23.30
Alabama Basic	17.65
Virginia Basic	17.65

Billets.—As an indication of the Billet situation we are informed that the leading producer has just bought 1000 tons of Open Hearth Forging Billets from a local Wire mill owning its own Open Hearth furnaces and Steel works. The buyer of Billets, who is unprotected by a contract, is fortunate if he can secure $28, Chicago, for base sizes, and he may have to pay up to $30 in car lots and still higher for smaller lots from store.

Rails and Track Supplies.—The Illinois Steel Company has now on its books new orders aggregating 600,000 tons of Standard Section Rails. It carried over from last year about 100,000 tons, and its full capacity, night and day turn, is only about 725,000 tons. For this reason it has withdrawn from the competitive market on Standard Section Rails in order to have a small margin left for taking care of its own particular customers. This will throw the Western markets open to Eastern mills, which have been prevented from booking much business heretofore by the freight differential of $2.80 a ton against Pittsburgh mills. Western railroads hereafter will have to pay $28 at Pittsburgh, Johnstown or Buffalo instead of $28 at Chicago for their Standard Section Rails. Light Section Rails are in very fair demand and are firm at $24 to $27 per gross ton at maker's mill in round lots, with higher prices charged for small lots. Angle Bars are 1.40c. to 1.50c.; Spikes, 1.70c. to 1.75c.; Track Bolts, 2.40c. to 2.50c., base, with Square Nuts, and 10c. to 15c. higher for Hexagon Nuts. Store prices on Track Supplies range from 15c. to 25c. per 100 lbs. above car lot mill prices.

Structural Materials.—Contract for the Steel for the Mercantile Building, which is to be built on the west side of State street just south of Madison, by Stumer, Eckstein & Rosenthal has just been placed with the Brown-Ketcham Iron Works, Indianapolis. It aggregates over 1600 tons. Specifications for the Boston store calling for between 6000 and 8000 tons of Steel are being figured on. Other contracts of some magnitude are also in the air. Local bridge and structural shops are far from busy. Prices are as follows: Beams and Channels, 3 to 15 inches, inclusive, 1.76½c.; Angles, 3 to 6 inches, ¼-inch and heavier, 1.76½c.; Angles, larger than 6 inches on one or both legs, 1.86½c.; Beams, larger than 15 inches, 1.86½c.; Zees, 3 inches and over, 1.76½c.; Tees, 3 inches and over, 1.81½c., in addition to the usual extras for cutting to exact lengths, punching, coping, bending or other shop work. Store prices for either random lengths or cut to lengths on Angles, Beams and Channels, base sizes, range from 2c. to 2.10c., with the usual extras for size.

Plates.—There is an increasing scarcity of Steel Plates, and some mills are refusing to quote on them at all. Most of the mills are 60 to 90 days' behind their orders. Prices are unchanged, as follows: Tank quality, ¼-inch and heavier, wider than 14 and up to 100 inches wide, inclusive, car lots, Chicago, 1.76½c.; 3-16 inch, 1.86½c.; Nos. 7 and 8 gauge, 1.91½c.; No. 9, 2.01½c.; Sheared and Universal Mill Plates, tank quality, 6¼ to 14 inches, inclusive, 10c. below these prices; Flange quality in widths up to 100 inches, 1.86½c., base, for ¼-inch and heavier, with the same advances for lighter weights; Sketch Plates, tank quality, 1.86½c.; Flange quality, 1.96½c. Store prices on Plates are as follows: Tank Plate, ¼-inch and heavier up to 72 inches wide, 2c. to 2.10c.; from 72 to 96 inches wide, 2.10c. to 2.20c.; 3-16 inch up to 60 inches wide, 2.10c. to 2.20c.; 72 inches wide, 2.35c. to 2.45c.; No. 8 up to 60 inches wide, 2.15c. to 2.25c.; Flange quality, 25c. extra.

Sheets.—This market grows stronger every day, and inquiry increases with increasing strength of tone. The Inland Steel Company will start up its plant in April, and is already booking business in large volume. There is a possibility amounting to a probability that prices will be advanced on Black Sheets. The following are the official minimum prices for car lots and greater at Chicago, delivered from mill: Blue Annealed Sheets, Nos. 9 and 10, 1.86½c.; Nos. 11 and 12, 1.91½c.; Nos. 13 and 14, 1.96½c.; Nos. 15 and 16, 2.06½c.; Box Annealed Sheets, Nos. 18 and 20, 2.21½c.; Nos. 22 and 24, 2.26½c.; Nos. 25 and 26, 2.31½c.; No. 27, 2.36½c.; No. 28, 2.46½c.; No. 29, 2.61½c.; No. 30, 2.71½c. Store prices rule as follows: Blue Annealed Sheets, No. 10, 2.05c. to 2.15c.; No. 12, 2.10c. to 2.20c.; No. 14, 2.20c. to 2.30c.; No. 16, 2.25c. to 2.35c.; Box Annealed Sheets, Nos. 18 and 20, 2.45c. to 2.50c.; Nos. 22 and 24, 2.45c. to 2.55c.; No. 26, 2.50c. to 2.60c.; No. 27, 2.60c. to 2.70c.; No. 28, 2.70c. to 2.80c. Galvanized Sheets from mill are held quite firmly at the following minimum base prices, f.o.b. Chicago, in car lots: No. 16, 2.71½c.; Nos. 18 and 20, 2.86½c.; Nos. 22 and 24, 3.01½c.; No. 26, 3.21½c.; No. 27, 3.41½c.; No. 28, 3.61½c. These prices range from 75, 10 and 5 for No. 16 to 75, 10 and 10 for the heavier gauges. New prices quoted by local jobbers are as follows for small lots from store in base width: Nos. 10, 12 and 14, 3.10c. to 3.20c.; No. 16, 3c. to 3.10c.; Nos. 18 and 20, 3.10c. to 3.20c.; Nos. 22 and 24, 3.25c. to 3.35c.; No. 26, 3.50c. to 3.60c.; No. 27, 3.70c. to 3.80c.; No. 28, 3.95c. to 4.05c.; No. 29, 4.40c. to 4.50c.; No. 30, 4.85c. to 4.95c. Extras for width vary with the gauges.

Bars.—Iron Bars are strong at 1.60c. to 1.65c., and the lower price is quoted only on exceptionally large and desirable specifications carrying good extras. Even at the higher price Iron Bars are now 30c. a ton below the official price for Steel, and buyers who can use either are giving their preference to the Iron. The leading Bar producer sold about 8000 tons of Bars last week, of which over 60 per cent. was Iron. Specifications on both Iron and Steel Bars are heavy, and there is some new business being booked. The low price at which Hoops are sold now places a number of gauges of Hoops lower than corresponding gauges of Bands, a condition that is not likely to be permanent. A peculiar feature of the market is the fact that Hard Angles rolled from Old Rails are now quoted up very near to the basis of Soft Steel Shapes. The advance in this commodity since last summer was $9 a ton. The minimum car lot prices on Steel products at Chicago for shipment from mill are as follows: Soft Steel Bars and Bands, 1.66½c., base, half extras, Bessemer or Open Hearth; Soft Steel Hoops, unchanged but strong at 1.71½c., full extras; Soft Steel Angles, Channels, Tees and Shapes belonging to the Bar class, 1.76½c., half extras. In store prices, Steel Bars and Bands are being held at a minimum of 1.85c., base, half extras, and Steel Angles and Shapes, 1.95c., half extras, while Soft Steel Hoops are unchanged at 2.10c., full extras, with 5c. to 10c. higher than the minimum prices named for small quantities from store.

Merchant Steel.—There is no let up in activity in specifying and a number of mills are in a position where

they are refusing to book orders except from favored customers whom they feel that they must take care of. Official prices, Chicago, in car lots, are as follows: Smooth Finished Machinery Steel, 1.91½c.; Smooth Finished Tire, 1.86½c.; Flat Sleigh Shoe, 1.71½c.; Concave and Convex Sleigh Shoe, 1.86½c.; Cutter Shoe, 2.40c.; Toe Calk Steel, 2.23½; Railway Spring, 1.86½c.; Crucible Tool Steel, 6½c. to 8c.; special grades of Tool Steel, 13c. and up; Shafting, 50 per cent. discount in car lots and 45 per cent. in less than car lots in base territory.

Merchant Pipe.—There is a temporary lull in the Pipe business, but it is ascribed to the fact that jobbers have ample stocks to take care of current demand and will not reorder until their present stocks are depleted. Information is given that an unusually large business has been transacted in this commodity during the winter months. Discounts, Chicago, in car lots, are as follows:

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	65.85	49.85	63.85	47.85
⅜ and ½ inch	69.85	57.85	67.85	55.85
¾ to 6 inches	73.85	63.85	72.85	62.35
7 to 12 inches	68.35	53.85	67.35	57.85
Extra strong pipe, ⅛ to ⅜ inch	58.85	46.85	56.85	44.85
½ to 4 inches	65.85	53.85	63.85	57.85
4½ to 8 inches	61.85	49.85	59.85	47 85
Double extra strong, pipe. ½ to 8 inches	54.85	43.85	52.85	41.85

Boiler Tubes.—Evidently all Tube manufacturers in the United States are agreed on prices, which are held firmly by all interests on the following basis for car lots at Chicago:

	Steel.	Iron.	Seamless.
1 to 1½ inches	44.35	41.35	54.35
1¾ to 2¼ inches	56.35	41.35	42.35
2½ inches	58.35	46.35	45.35
2¾ to 5 inches	64.35	53.35	up to 4 in. 52.85
6 to 13 inches	56.35	41.35	....

Discounts on less than car lots from mill are two points lower, equivalent to an average of $4 a ton higher in price. While there is no unanimity or agreement between jobbers as to the discounts from store, the average for fairly large orders is based on the following discounts, f.o.b. warehouse:

	Steel.	Iron.	Seamless.
1 to 1½ inches	40	35	42½
1¾ to 2¼ inches	50	35	35
2½ inches	52½	35	37½
2¾ to 5 inches	60	47½	47½
6 inches and larger	50	35	..

Cast Iron Pipe.—The city of Santa Ana, Cal., has closed with the leading producer an order for 1800 tons of Cast Pipe, and Minneapolis has bought 1000 tons from the same interest. Youngstown, Ohio, authorities decided to reject all bids and to readvertise. Spring business is opening up satisfactorily, and, in consideration of the strength in Pig Iron, prices of Cast Pipe have been advanced 50c. a ton for ordinary small lots, making the new prices at Chicago as follows: $29 a gross ton for 4-inch Pipe and $28 for 6-inch and larger, with $1 a ton higher for Gas Pipe.

Old Materials.—Only a few minor changes are made in prices as compared with last week, Old Iron Rails and Angle Bars both being advanced 50c. and some other lines being reduced about the same amount. Business is quiet, as dealers owning stocks that are paid for and in their yards seem willing to hold them for higher prices, while there is not a sufficient buying movement to make a market on many lines. The following prices represent the range at which large consumers can buy their Scrap from railroads or dealers in large quantities:

Old Iron Rails	$20.00 to $20.50
Old Steel Rails, 4 feet and over	15.50 to 16.00
Old Steel Rails, less than 4 feet	14.50 to 15.00
Heavy Relaying Rails, subject to inspection	22.50 to 23.00
Heavy Relaying Rails, for side tracks	20.00 to 20.50
Old Car Wheels	15.75 to 16.00
Heavy Melting Steel Scrap	14.50 to 15.00
Frogs, Switches and Guards	14.50 to 15.00
Mixed Steel	10.00 to 10.50

The following quotations are per net ton:

Iron Fish Plates	$18.00 to $18.50
Iron Car Axles	21.00 to 21.50
Steel Car Axles	16.50 to 17.00
No. 1 Railroad Wrought	16.50 to 17.00
No. 2 Railroad Wrought	15.50 to 16.00
Shafting	16.50 to 17.00
No. 1 Dealers' Forge	12.50 to 13.00
Wrought Pipes and Flues	11.75 to 12.00
No. 1 Cut Busheling	11.50 to 12.00
Iron Axle Turnings	11.50 to 12.00
Soft Steel Axle Turnings	11.50 to 12.00
Machine Shop Turnings	11.00 to 11.50
Cast Borings	8.50 to 8.75
Mixed Borings, &c	8.75 to 9.00
No. 1 Mill	9.75 to 10.00
Country Sheet	8.00 to 8.50
No. 1 Boilers, cut to Sheets and Rings	11.50 to 12.00
No. 1 Cast Scrap	13.25 to 13.50
Stove Plate and Light Cast Scrap	11.00 to 11.50
Railroad Malleable	13.50 to 14.00
Agricultural Malleable	12.50 to 13.00

Metals.—Speculation is responsible for an advance of ½c. on Pig Tin. Otherwise the same inactivity noted last week continues, with prices unchanged. We quote: Copper is held at 15⅛c. to 15¼c. for Casting, and 15⅜c. to 15⅝c. for Lake, in car lots, with ¼c. to ½c. higher for small lots. Lead is quoted in 50-ton lots at 4.45c., in car lots at 4.50c. and 5c. to 5¼c. in small lots; Pig Tin at 30¼c. to 30½c. in car lots, and 31c. to 31½c. in less than car lots. Spelter is in slow demand, the car lot price being 6¼c. and the small lot price 6½c. Sheet Zinc is held at $7.50, base, La Salle, equivalent, after deducting discounts, to $7.25, Chicago, for car lots of 600-lb. casks, with small lots selling at $7.50 to $8. Prices of Old Metals are as follows: Copper Wire, 13½c.; Heavy, 13c.; Copper Bottoms, 12c.; Copper Clips, 12¾c.; Red Brass, 12c.; Red Brass Borings, 10⅜c.; Yellow Brass, Heavy, 9c.; Yellow Brass Borings, 7⅞c.; Light Brass, 7¼c.; Lead Pipe, 4¼c.; Tea Lead, 3.85c.; Zinc, 4½c.; Pewter, No. 1, 19¼c.; Block Tin Pipe, 25c.

Coke.—There are some instances in which oven representatives here are getting prices equivalent to $3.15 and as high as $3.25 at the ovens for 72-hour Connellsville. At the same time Coke from the Connellsville region is being sold for extended delivery generally on the basis of $3. Other grades of Coke less favored are selling on the basis of $2.75 to $3 at the ovens for Foundry quality. Furnace Cokes rule strong at $2.50 to $2.75. To all the above prices $2.65 freight should be added to make Chicago delivered price, except in the case of Coke from Wise County, Virginia, operations, which are favored by a $2.25 freight rate. Prices on these Cokes at the ovens range from $3 to $3.25, making the Chicago price from $5.25 to $5.50.

Wm. B. Walter & Co., Marquette Building, Chicago, have established an office for the sale of Iron, Steel and Metal Castings, Forgings and Iron and Steel merchandise generally.

Philadelphia.

FORREST BUILDING, March 14, 1905.

The Iron market maintains a surprising degree of strength, although the source of the buying is from a new quarter. Foundrymen who bought heavily last fall begin to see the end of their contracts, and are now going in for renewals. Makers of Pig Iron show entire willingness to accommodate their own trade, but they are decidedly shy on outside business. This leads to irregularity in prices, inasmuch as new applicants are quoted something beyond what would be accepted from the regular trade, the intention being to take care of the latter as far as it may be possible to do so. In this way $17.50 for No. 2 Plain and $18 for No. 2 X are the usual quoted rates for both grades to new buyers, although there is an increasing tendency to get away from the inside rate of $17 and $17.50, which figures have been quoted to regular buyers of the grades named, but which prices are liable to be withdrawn at any moment. The demand is very large, and buyers are not inclined to haggle over 25c. or 50c. per ton in prices if they can get the Iron they want and the deliveries they want. As a matter of fact, the course of events during the past week has on the whole been very favorable to the selling interests, so that they either get the prices they think they are entitled to or let the business go elsewhere. It is a good feature that any little dullness that may develop in one direction is immediately offset by activity at some other point, so that there is no chance for reaction. Moreover, new work keeps cropping out all the time, and while a large proportion of the inquiries may not result in immediate business, yet there is enough taken up to insure great activity during the next three or four months. With the near approach of warm spring weather, the feeling in all directions is of the most confident character, and it must be admitted that all the indications seem to warrant expectations of a much larger volume of business than at any time in the history of the trade. Prices are a matter of more or less uncertainty. If buyers will exercise patience they will be likely to get all the material they need without paying high prices, but if they insist on producers entering orders for large tonnages and long deliveries they will certainly have to pay more money. Considering that foreign markets could furnish Iron at $1 to $2 per ton over to-day's prices, and that our own furnaces can do much better work when they get rid of the handicap of inefficient railway service, inferior fuel, &c., there is no occasion for alarm. This, however, will require time to develop, but in the meanwhile buyers would probably not run much risk by adopting a conservative course. In the more advanced products the movement has been quite satisfactory. It cannot be said that there is any great rush of orders, or that there is much difficulty in getting prompt shipments, but there is a steady run of first-class business, and if any change at all, it favors manufacturers, so that the feeling is one of extreme hopefulness as regards developments during the spring and summer months.

Pig Iron.—The demand during the past week has run mostly to Foundry Irons, in which a large business has been done. Those who bought heavily last fall are beginning to see the end of their contracts and are now disposed to make renewals extending to and through the third and fourth

quarters of the year. Makers of Pig Iron are not particularly anxious for business of this kind, although it is probable that more than half the estimated capacity of the furnaces has been engaged for the remainder of the year. The outlook in regard to prices is so uncertain that furnace owners wish to reserve some portion of their output to meet contingencies; consequently with more than half their capacity under contract they are naturally conservative in regard to the remainder. The present situation can hardly be gauged by anything in the past, however, so that to say that prices will be higher would be somewhat hazardous. Yet it hardly seems possible that they can be lower, and if not that, there is always a chance of a considerable movement in the other direction. Some of the conditions which may lead to an advance are, first, that the current demand is the largest on record; second, the entire output seems to go into immediate consumption; third, money is plentiful; fourth, prosperity is more widespread and general than ever before, and, lastly, the close of the war in the East may throw an enormous amount of additional business into this country just at the time when our own requirements are approaching the highest point they have ever reached. There may be something to offset these features, or they may not reach the high limit that is expected, but so far as can be seen at the present time these are the contingencies most likely to be met with during the next few months, and it will do no harm to figure on them as possibilities, if not the probabilities, of the near future. It is with these in view that makers and sellers of Pig Iron discriminate very closely in regard to what they offer. Sales have been very heavy in all the foundry grades, large lots of No. 2 Plain having been taken at $17 to $17.25, delivered, and No. 2 X Foundry at $17.50 to $17.75. Small lots have sold at 25c. more money, and the general trend is toward slightly higher figures. Basic Iron is wanted for April and May shipments, but there is very little on offer, although $17 might bring out a small tonnage. The range of prices for deliveries in buyers' yards would be about as follows, varying according to tonnage and proximity to furnace:

No. 1 X Foundry	$18.00 to $18.25
No. 2 X Foundry	17.50 to 18.00
No. 2 Plain	17.00 to 17.50
Standard Gray Forge	16.00 to 16.50
Ordinary Gray Forge	15.50 to 15.75
Basic	16.75 to 17.00
Low Phosphorus	20.00 to 20.50

Ferromanganese.—The market is very much stronger and it would probably be difficult to place orders at less than $45.50 to $46, delivered to nearby mills. Sales are said to have been made at a sharp advance on last week's prices.

Muck Bars.—There is more demand and makers are asking, say, $28.75 to $29.25, f.o.b. seller's mill, and about $39 to $40 for Low Phosphorus Bars.

Steel.—There is a very active demand, and mills are so well filled up that they are not looking for outside business. The best class of orders are taken at about $28, but small lots command $29 to $30.

Plates.—There is nothing of special importance on the market at the present time, but mills are turning out a large tonnage which is promptly taken. There is a large business in prospect, and mills expect to utilize their utmost capacity during the remainder of the year. Prices are unchanged but strong as last quoted:

	Carload. Cents.	Part carload. Cents.
Tank, Bridge and Boat Steel, over 14 inches wide	1.73½	1.78½
Tank, Bridge and Boat Steel, rectangular Plates, 14 inches wide and under	1.63½	1.68½
Flange or Boiler Steel	1.83½	1.88½
Marine, A. B. M. A. and Commercial Fire Box Steel	1.93½	1.98½
Still Bottom Steel	2.03½	2.08½
Locomotive Fire Box Steel	2.23½	2.28½

The above are base prices for ¼-inch and heavier. The following extras apply:

	Per 100 pounds extra.
3-16-inch thick	$0.10
Nos. 7 and 8, B. W. G.	.15 "
No. 9 B. W. G.	.25 "
Plates over 100 to 110 inches	.05 "
Plates over 110 to 115 inches	.10 "
Plates over 115 to 120 inches	.15 "
Plates over 120 to 125 inches	.25 "
Plates over 125 to 130 inches	.50 "
Plates over 130 inches	1.00 "

Structural Material.—The general demand is very satisfactory, although orders as yet are not particularly heavy. Bridge work, car building and other important interests are consuming heavily, however, and there is every reason to expect a large business during the remainder of the year. Prices are about as follows: Beams, Channels and Angles, 1.73½c. to 1.85c., according to specifications, and small Angles, 1.65c. to 1.68c.

Bars.—Business is very satisfactory, both as regards tonnage and prices, although, of course, there are always some sellers who are a little weakkneed. Best Refined Iron, however, cannot be had for less than 1.75c. to 1.80c., delivered; some ask more than that. The high price for raw material may result in a further advance in Bar Iron, but for the present quotations are as above named. Steel Bars, 1.63½c. to 1.70c., but it is difficult to get prompt deliveries of Steel Bars unless the outside figure is paid.

Sheets.—Mills have hard work to make satisfactory deliveries, although they are running to full capacity. Prices strong and quoted according to quantity, delivery, &c.

Old Material.—Holders appear to have control of the market, and have been able to force higher prices for most of the material sold during the past week. Prospects seem to favor higher prices, bids and offers being about as follows for deliveries in buyers' yards; most sales at medium or higher figures:

Old Steel Rails	$18.00 to $18.50
No. 1 Steel Scrap	17.75 to 18.25
Old Steel Axles	22.50 to 23.50
Old Iron Axles	26.50 to 28.00
Old Iron Rails	24.50 to 25.50
Old Car Wheels	17.00 to 17.50
Choice Scrap, R. R. No. 1 Wrought	23.00 to 23.50
No. 1 Yard Scrap	20.50 to 21.00
Machinery Scrap	16.00 to 16.50
Low Phosphorus Scrap	21.50 to 23.00
Wrought Iron Pipe	16.50 to 17.00
No. 1 Forge Fire Scrap	16.50 to 17.00
No. 2 Forge Fire Scrap, Ordinary	13.00 to 13.50
Wrought Turnings	15.50 to 16.00
Axle Turnings, Choice Heavy	16.50 to 17.00
Cast Borings	11.50 to 12.00
Stove Plates	13.50 to 14.00

Cincinnati.

FIFTH AND MAIN STS., March 15, 1905.—(*By Telegraph.*)

Pig Iron.—The market, while it still rules strong, does not present that active phase that was a noticeable feature in last week's report. There are no advices of any large inquiries pending; what tonnage has been sold has been in the way of 200 and 300 ton lots. The majority of the furnaces are said to be willing to contract for the third quarter, but are showing no apparent desire to continue this over the last half. Prices of both Northern and Southern grades are holding firm, and the consensus of opinion seems to be that they will go no lower for some time to come. The basis for this reasoning appears to be the fact that large concerns, like the Steel Corporation, which have orders for five or six months in advance and specifications to run them for possibly a longer period, are up to their maximum capacity, and the outlook for continued great tonnage is exceedingly bright indeed. The only industries that have not responded to movement are the jobbing foundries, excepting possibly those which are engaged in making specialties. The prediction is, however, that as the spring advances all concerns of this class will feel the impetus of trade and more or less respond in sympathy with the general market. The leading Cast Iron Pipe company, while said not to be in the market for any specific tonnage, is, nevertheless, doing some buying when conditions are satisfactory. Freight rates from Hanging Rock district to Cincinnati, $1.15, and from Birmingham, $2.75. We quote, f.o.b. Cincinnati, as follows:

Southern Coke, No. 1	$16.75 to $17.00
Southern Coke, No. 2	16.25 to 16.50
Southern Coke, No. 3	15.75 to 16.00
Southern Coke, No. 4	15.25 to 15.50
Southern Coke, No. 1 Soft	16.75 to 17.00
Southern Coke, No. 2 Soft	16.25 to 16.50
Southern Coke, Gray Forge	15.25 to 15.50
Southern Coke, Mottled	14.75 to 15.00
Ohio Silvery, No. 1	20.65 to 21.15
Lake Superior Coke, No. 1	17.40 to 17.65
Lake Superior Coke, No. 2	16.90 to 17.15
Lake Superior Coke, No. 3	16.40 to 16.65
Car Wheel and Malleable Iron.	
Standard Southern Car Wheel	$18.50 to $19.00
Lake Superior Car Wheel and Malleable	18.00 to 18.50

Coke.—General conditions are much easier, with a full supply readily obtainable. Prices are holding strong and are unchanged. We quote the best grades of Connellsville Foundry from $2.75 to $3, f.o.b. ovens.

Plates and Bars.—Agents are said to have contracted the mills' supply for some months to come and are unwilling to bind themselves for a later period. Prices are unchanged. We quote, f.o.b. Cincinnati, as follows: Iron Bars, in carload lots, 1.65c., with half extras; the same in smaller lots, 1.90c., with full extras; Steel Bars, in carload lots, 1.63c., with half extras; the same in smaller lots, 1.85c., with full extras; Base Angles, 1.73c., in carload lots; Beams and Channels, in carload lots, 1.73c.; Plates, ¼-inch and heavier, 1.73c., in carload lots; in smaller lots, 1.90c.; Sheets, 16-gauge, in carload lots, 2.15c.; smaller lots, 2c.; 14-gauge, in carload lots, 2.05c.; in smaller lots, 2.60c.; Steel Tire, ¾ x 3-16 and heavier, 1.73c., in carload lots.

Old Material.—Dealers say that there is no difficulty in securing all of this class of material they want, but there is at the present very little demand from consumers. Prices are about the same as last week's quotations. We quote dealers' prices, f.o.b. Cincinnati, as follows: No. 1 Railroad Wrought Scrap, $17 to $18 per net ton; No. 1 Cast Scrap, $14 to $14.50 per net ton; Iron Rails, $21.50 to $22 per gross ton; Steel Rails, rolling mill lengths, $14.50 to $15 per gross ton; Relaying Rails, 56-lb. and upward, $23 per gross ton; Iron Axles, $21 to $22 per net ton; Car Wheels, $16 to $17 per gross ton; Heavy Melting Scrap, $14.50 to $15 per gross ton; Low Phosphorus Scrap, $17 to $18 per gross ton.

Cleveland.

CLEVELAND, OHIO, March 14, 1905.

Iron Ore.—Recent and prospective heavy sales of Pig Iron are having a tendency to increase the sales of Ore for delivery during the coming season of navigation. It would not be surprising, therefore, to see some heavy sales of Ore before long. There is no tendency to change the prices, producers being disposed to be content with the amount which has been obtained on the sales made so far. The base prices, therefore, are undisturbed at $3.75 for Bessemer Old Range, $3.50 for Bessemer Mesaba, $3.25 for non-Bessemer Old Range and $3 for non-Bessemer Mesaba. It is generally believed in Iron Ore circles that a new record of production will be made during the current year. It is possible that the total production will exceed 30,000,000 gross tons. Ore producers revise their estimates on the knowledge that the current melt is unprecedented and that the new productive capacity is actively engaged melting Ore for use. These prospects are inclined to make vesselmen restive under the contracts they have made for the transportation of Ore. They are tied up for the year, moreover, and cannot change that condition. Some of the more independent owners are disposed to hold off and charter their boats at the wild or going rate, expecting better returns in that way. This tendency is increased when it is understood that labor conditions are constantly becoming more threatening. The pilots have assumed a menacing attitude, refusing to be put aside without recognition and threatening to withdraw from the Longshoremen's Union unless recognition is insisted upon. This may complicate the lake situation and delay the opening of navigation, which is now expected about April 1.

Pig Iron.—There is a good demand for Basic. All buyers are now insisting on delivery early, some of them anticipating shipments. There is also a prospect of a shortage before the second quarter is past, and most producers are refusing to sell further ahead than 60 days. They expect higher prices before that time has elapsed. The present price is $15.50 in the Valley. The Foundry trade is unchanged, with the possible exception of an increase in the demand for Iron for second half delivery. The market is strong, but the price has not changed, holding at $16 in the Valley for No. 2. Southern producers are finding a little more ready market in the North, but the oversold condition of the furnaces and their price preclude the possibility of very heavy sales. They are holding for $13.50, Birmingham, for all material, with No. 2 as a base. To this is added a freight rate of $3.85 to make up the Cleveland price. The Coke situation is strong. The heavy buying of one concern added to the shortage of cars and the congested condition of the ovens is making prices strong. The quotations are $3 at the oven for 72-hour Foundry Coke, and $2.50 to $2.60 for Furnace Coke.

Finished Iron and Steel.—The situation here is strong, being influenced largely by general conditions. Mill men are holding back on taking new orders in Plates, Shapes and Pipe. The Sheet trade is strong, with mills refusing to make long time contracts, and Billets are selling at a premium. With most mills it is a question of deliveries rather than of business. The Bar trade is really the most interesting question of the hour. Bar Iron has been a light seller, due to the disparity in prices of Iron and Steel. The recent demand for Bar Iron is an outcome of seasonable conditions, and also of the advance in the Bar Steel prices. The Bar Iron mills are now comfortably fixed as to business obtained on the old basis of prices, 1.65c. to 1.75c., Youngstown. The Bar Steel prices are unchanged at 1.50c., Pittsburgh, for Bessemer and 1.60c. for Open Hearth. The expectation that Sheet prices will be advanced is responsible for an effort to buy for long time delivery, and also accounts for the hesitancy of the mills in making contracts. In the Rail trade some important developments are expected this spring locally, as four or five traction lines are planning to build important extensions.

Old Material.—The Scrap market is a little stronger, but in the main prices hold about as they have been. Buying has increased by the mills in some lines. We continue to quote, all gross tons: Old Steel Rails, $16 to $16.50; Old Iron Rails, $23 to $23.50; Old Car Wheels, $17; Heavy Melting Steel, $16 to $17. All net tons: Cast Borings, $9 to $10; No. 1 Busheling, $14 to $15; No. 1 Railroad Wrought, $17.50 to $18; Iron Car Axles, $21 to $22; No. 1 Cast, $14.50 to $15; Stove Plate, $11 to $12; Iron and Steel Turnings and Drillings, $12 to $12.50.

Announcement is made of the formation of the firm of Runyon, Fairbank & Co. to do a jobbing business in Iron Ore, Pig Iron, Coal and Coke. The members of the firm are: W. C. Runyon, George L. Fairbank and A. Grossman. Mr. Runyon is president of the Struthers Furnace Company, which grew out of the firm of Runyon, Stubbs & Co. Mr. Fairbank is secretary and Mr. Grossman is treasurer of the same company, with which they have been connected for a number of years. The offices will be located at 1106 Citizens' Building, Cleveland. The firm is already actively engaged in business.

Birmingham.

BIRMINGHAM, ALA., March 13, 1905.

About the same quotations that were given in last week's letter prevailed for the week just ended. Iron was in very fair demand, and the sales were in volume very satisfactory. From some of the interests very favorable reports are obtained, both as regards prices and the amount of business concluded. From some come stories not quite so rosy, but the consensus of reports favors the former, and enough information percolated to justify the statement that the strength of the market as heretofore reported was well maintained.

Some buyers of round lots were in the market, but all of them did not get the full amount desired. The paring of orders still continues, when they are of magnitude, and the distribution is made as wide as circumstances permit. There is no excitement whatever in the market, and there is not even an active interest manifested. Sellers have settled down to the conclusion that there will be a satisfactory market for all they can produce, and they will get it after a little wait. Besides that feeling, there is the knowledge that some Iron bought in the recent past is being offered at resale; and in some cases a shaded price is made to tempt buyers. But in volume the lots of this class of Iron are not sufficient in magnitude to create any uneasiness. There is gossip concerning some of these sales, and the most of it is without solid substantiality.

To show the character of the trade, one of the leading interests has sold, so far this month, 20,000 tons, the most of it, in delivery, being confined to the second quarter. Some of it went for delivery in the third quarter; but the bulk of it was for nearby delivery. The price has varied from $13.50 to $14, basis of No. 2 Foundry. As stated in last letter, when the maximum price is shaded, the reins are drawn tighter on the differences between grades. The records of sales have been seen at both $14 and $13.75 for No. 2 Foundry, and rumors have been heard of sales at $13.50; but no one can be found to father any sales at $13.50. Some sales of No. 3 Foundry were made at $13.50, but they were limited in volume. The same grade also sold at $13.25 in the early part of the week. Gray Forge and Mottled sold at $13 and $12.75, while White Iron, in a very limited way, went at $12.50.

Orders for 1000-ton lots were in very good evidence, and from that amount down to car lots the business was rather active. There were a limited number of orders for 5000-ton lots, and they were accepted in two cases. The reported price and the rumor prices do not agree, and it looks as if these round lots went at basis of $13.50 for No. 2 Foundry. The Foundry trade has been a good deal more in evidence as buyers than for some time past.

For the second half of the year delivery it is difficult to speak because sellers are not free with information concerning their sales for that delivery. Your correspondent has seen sales registered for that delivery on the basis of current values, and also at premiums over current values. In nearly every case there was a special reason for the act. There is now more or less business for that delivery being accepted right along, but there is no uniform price. That there is no accumulation of Iron in melters' hands is evidenced by the anxiety of buyers to have prompt shipment of purchases made, and including some that have not matured.

In warrants there has been some trading; but it has been of very limited volume and on the basis of $13.50 for No. 2 Foundry.

Coal and Coke are still scarce. The amount of Coal production in the State for 1904, as given by the Mining Inspector of the State, was 11,700,000 tons, the decrease from the preceding year being in round numbers about 400,000 tons. A dissection of the report shows that the counties where the union miners were well organized suffered the greatest loss in output.

The Tennessee Company, at its Pratt mines, is introducing improvements in the way of electric haulage and in repairs that will greatly tend to more efficiency and to larger results in the matter of costs. It is also building about 200 houses for housing miners.

The surveys for the location of the Mobile & West Alabama Railroad are completed and a branch has been located from Tuscaloosa to this city. The financing of the road was made conditional upon the accomplishment of certain conditions, which have been complied with. Options on about 300,000 acres of Coal lands on the line surveyed for the road have been obtained. It will open for development a fine section of the State and soon attract new settlers.

News comes of the sole right acquired to make and put upon the market the turbine patented by Mr. Wilkinson of this city. The International Power Company of New York will be the dominating factor, and gossip has it that a plant to make the machines will be located in this district.

The Ivy Leaf & Piper Coal Company was incorporated the past week, capitalized at $50,000. The incorporators are

J. R. Smith, Colin Campbell and J. M. Smith. The main offices will be in this city.

Everything indicates a continuance of the prosperity that has been attendant, so far, on the progress of the district.

Pittsburgh.

PARK BUILDING, March 15, 1905.—(*By Telegraph.*)

Pig Iron.—While the market has been rather quiet in the past week as regards sales, the tone is fairly strong. The Bessemer Pig Iron Association and other leading producers quote $15.50, Valley furnace, for Bessemer and Basic Iron for forward delivery, but a few smaller sellers are willing to shade this price about 25c. a ton. However, the amount of Iron that is available at this lower price is relatively small. There is a moderate inquiry for Foundry Iron, notably from small foundries, indicating that they are getting pretty well filled up with orders. Northern brands of No. 2 Foundry Iron are held at $16, Valley furnace, or $16.85, Pittsburgh. Some sellers quote as high as $16.50 at furnace, but they are practically out of the market, being sold up for several months and are not anxious to take on additional tonnage. There is some inquiry for Forge Iron for second and third quarter delivery and the market is a little stronger. We quote Northern brands of Forge at $15.15 to $15.25, Valley furnace, equal to $16 and $16.10, Pittsburgh. Although the present total output of Pig Iron is running about 1,750,000 tons a month, or 22,000,000 tons a year, this tremendous output is going into actual consumption, thus showing that the Steel and finishing mills are full of orders.

Steel.—The consumption of Billets and Sheet and Tin Bars continues on an enormous scale, and the Steel mills do not seem to be catching up to any extent on deliveries on which they are for weeks or longer behind. A part of the product of the Donora Open Hearth plant is being taken to the Homestead Steel Works of the Carnegie Steel Company. The Homestead Works is very short of Open Hearth Ingots, and is being helped out by Donora. The greatest scarcity is in Open Hearth Steel, which is causing delay in deliveries of Bars, Structural Steel and Plates from Open Hearth material. Bessemer and Open Hearth Billets for prompt shipment continue to bring about $24, while Sheet and Tin Bars in random lengths are held firmly at $26, and Cut Bars $26.50, maker's mill, for April, May and June delivery. Forging Billets bring $26 and higher, depending on carbons.

Structural Steel.—The report that the New York Central Railroad has just placed an order for 1500 tons Structural Steel for bridges with the Carnegie Steel Company, which the Riter-Conley Mfg. Company, Pittsburgh, is to fabricate, is untrue. This contract was placed nearly six months ago and has been filled.

(*By Mail.*)

While the past week has been quiet in the Iron trade as regards amount of tonnage placed, indications point strongly to a very heavy volume of business as soon as spring trade opens up, which ought to take place within the next month. A very large amount of outside work has been held back by the inclement weather and when this work is once started it will mean a much larger demand for the various forms of Finished Iron and Steel that go into building construction. The tone of the whole market is strong and there is expectation that prices of wire products, sheets and tin plate will be advanced in the near future, probably before this month is out.

The Pig Iron market has been quiet, actual sales being confined to small lots only. The Steel Corporation may possibly buy 10,000 to 15,000 tons of Bessemer Iron for this month, but as yet nothing has been done. The Bessemer Pig Iron Association has no inquiries for Pig Iron, but is holding Bessemer and Basic at $15.50, Valley furnace, which may be regarded as the market price. There is still some Iron in dealer's hands which can be bought at slightly lower prices, but the tonnage is small. Furnaces report a better inquiry for Foundry Iron from small consumers, who are placing orders for a fair tonnage. Large consumers are pretty well covered for some time ahead and the trade in Foundry Iron is expected to be somewhat quiet for the next month or two. There is a fair inquiry for Forge Iron, Northern makes being held at $15.15 to $15.25, at furnace, or $16 to $16.10, Pittsburgh. Should the United States Steel Corporation make a general advance in wages about April 1, which it is expected to do, it is likely there will be a general advance in blast furnace labor of about 10 per cent., which would add only about 10c. a ton to the cost of making Iron.

There is a very great scarcity of Open Hearth Steel, the two leading makers in this district, the Carnegie Steel Company and Jones & Laughlin Steel Company, being sold up for some time ahead and are behind in deliveries of Billets, Bars, Plates and Structural Material made from Open Hearth Steel. Bessemer and Open Hearth Billets for prompt shipment readily bring about $24 and Sheet and Tin Bars about $26, maker's mill.

Tonnage in Finished Iron and Steel is moderate, but the mills are working mostly on contracts, on which buyers are specifying in a fairly satisfactory way. With the opening up of spring trade it is expected that finishing mills will be taxed to the utmost to meet the demands that will be made upon them for their product.

Ferromanganese.—We note a sale of 50 tons of foreign Ferro at about $44.50, delivered. The market is quite firm.

Rods.—There has been some inquiry recently and we note sales of Bessemer and Open Hearth Rods on the basis of $33, maker's mill. One leading local producer is practically out of the market as a seller and another producer is holding Bessemer and Open Hearth Rods at $34 and Chain Rods at $35, maker's mill.

Skelp.—There is a fair inquiry for Skelp, and on account of high prices for Steel, prices of Steel Skelp are very firm. We quote: Grooved Iron Skelp at 1.70c. to 1.75c., Sheared at 1.80c. to 1.85c., Grooved Steel Skelp, 1.65c. and Sheared 1.70c. to 1.75c. These prices are for ordinary widths and gauges and are f.o.b. maker's mill.

Muck Bar.—There has been some inquiry for Muck Bar recently and prices are firmer. We quote best grades made from all Pig Iron at $28.25 to $28.50, Pittsburgh.

Steel Rails.—Among contracts recently placed is one for 3000 tons of Steel Rails with the Carnegie Steel Company for the building of a railroad in British Zanzibar. It is understood that this road will be laid with Steel ties made at the Homestead Steel Works of the Carnegie Company. A shipment of 15,000 tons of Steel Rails has recently been made from the Chicago mills to Japan. It is said a through rate of 40c. per 100 lbs. was made from Chicago to point of delivery. Some of the mills rolling Light Rails have advanced these about $1.50 a ton on account of the scarcity and high price of Steel. We quote 12 to 16 lb. Rails at $26 to $27, and $24 to $25 for Heavier Sections.

Structural Material.—Some tonnage has recently been placed, and a great deal of work is coming up, among this the new buildings for the new Bessemer plant at Youngstown, and for the new Republic blast furnace at that place. Contracts recently placed include an extension to the Open Hearth plant of the Alan Wood Company, at Conshohocken, Pa., about 1500 tons; also for the new buildings of the Crescent Forging Company, about 500 tons and other work amounting to 3000 to 4000 tons. The Structural plants are having trouble in getting prompt deliveries from the mills of Structural Material rolled from Basic Steel on account of scarcity of the later. We quote: Beams and Channels, up to 15-inch, 1.60c.; over 15-inch, 1.70c.; Angles, 3 x 2 x ¼ inch thick up to 6 x 6 inches, 1.60c.; Angles, 8 x 8 and 7 x 3½ inches, 1.70c.; Zees, 3-inch and larger, 1.60c.; Tees, 3-inch and larger, 1.65c. Under the Steel Bar card Angles, Channels and Tees under 3-inch are 1.60c., base, for Bessemer and Open Hearth, subject to half extras on the Standard Steel Bar card.

Plates.—A fair amount of new tonnage is being placed in Plates, but the mills are running mostly on contracts placed some time ago by the Steel car companies and other consumers before the recent advance in prices was made. The leading Plate mills are filled up for the next two or three months or longer and the outlook is very good. It is said official prices are being rigidly observed and that some of the Plate mills that have to buy their Steel in the open market and pay high prices for it are urging a further advance in Plates on this account. We quote: Tank Plate, ¼-inch thick, 6¼ to 14 inches wide, 1.50c., base; over 14 inches wide and up to 100 inches in width, 1.60c., base, at mill, Pittsburgh. Extras over the above prices are as follows:

	Extra per 100 pounds.
Gauges lighter than ¼-inch to and including 3-16-inch Plates on thin edges	$0.10
Gauges No. 7 and No. 8	.15
Gauge No. 9	.25
Plates over 100 to 110 inches	.05
Plates over 110 to 115 inches	.10
Plates over 115 to 120 inches	.15
Plates over 120 to 125 inches	.25
Plates over 125 to 130 inches	.50
Plates over 130 inches	1.00
All sketches (excepting straight taper Plates varying not more than 4 inches in width at ends, narrowest end being not less than 30 inches)	.10
Complete Circles	.20
Boiler and Flange Steel Plates	.10
Marine, "A. B. M. A.," and ordinary Fire Box Steel Plates	.20
Still Bottom Steel	.30
Locomotive Fire Box Steel	.50

Shell Grade of Steel is abandoned.

TERMS.—Net cash 30 days. For anticipated payments a maximum discount may be allowed at the rate of 6 per cent. per

annum and for a longer time than 30 days interest shall be charged at the same rate per annum. Invoices paid within ten days from date thereof, discount of ½ of 1 per cent. is allowable. Pacific Coast base, 1.40c. f.o.b. Pittsburgh, with all rail tariff rate of freight to destination added, no reduction for rectangular shapes 14 inches wide down to 6 inches of Tank, Ship or Bridge quality.

Sheets.—A fair amount of new tonnage is being placed in Sheets and this, with contracts booked some time ago, keeps the Sheet mills fully employed. Every Sheet mill owned by the American Sheet & Tin Plate Company is in full operation, output in shipments by this concern being much the heaviest in its history. There is renewed talk of an early advance in Black Sheets to come before this month is out. We quote: No. 24, box annealed, one pass through cold rolls, 2.05c.; No. 26, 2.15c.; No. 27, 2.20c., and No. 28, 2.30c. We quote Galvanized Sheets as follows: Nos. 22 and 24, 2.85c.; Nos. 25 and 26, 3.05c.; No. 27, 3.23c.; No. 28, 3.45c. We quote No. 28 Gauge Painted Roofing Sheets at $1.65 per square, and Galvanized Roofing Sheets, No. 28 Gauge, at $2.95 for 2½-inch corrugation. Jobbers charge the usual advances over above prices for small lots from store.

Iron and Steel Bars.—Owing to the lower prices of Steel Bars a good many former consumers of Iron Bars have gone back to Steel, causing a falling off in demand for Iron Bars and a heavier tonnage in Steel. The leading mills rolling Steel Bars are entering a good deal of new tonnage and have heavy contracts on their books running up to July 1 and longer on which buyers are specifying very freely. We quote Common Iron Bars at 1.65c. to 1.70c. and Refined Iron Bars, 1.75c. to 1.80c., f.o.b. Pittsburgh. We quote Bessemer and Open Hearth Steel Bars at 1.50c., base, in carloads and larger lots, with the usual advance for smaller lots.

Hoops and Bands.—No advance has yet been made in price of Steel Hoops, which remain at 1.55c. at mill, while Bands are 1.50c., base, half extras, as per National Steel Bar card. There is very little new tonnage in either Hoops or Bands, consumers being covered by old contracts at lower prices.

Cotton Ties.—As yet the makers of Cotton Ties have not fixed prices for this year, but will likely do so shortly. The new price is expected to be 85c. per bundle for large lots, as stated in this report last week.

Tin Plate.—The Tin Plate trade continues very active in demand, the mills having all the business they can take care of for the next two or three months or longer. The trade is buying for delivery ahead and there is still talk of an early advance in prices. We continue to quote 100-lb. Cokes at $3.50 net, f.o.b. Pittsburgh, terms 30 days, or 2 per cent. off for cash in 10 days.

Merchant Pipe.—We note a moderate demand, which is expected to materially increase just as soon as good weather comes, permitting outside operations. Oil country goods continue quiet, as there has been very little done in the way of drilling new wells for the past two or three months. Prices in the main are being observed, discounts to consumers in carloads being as follows:

Merchant Pipe.

	Steel.		Iron.	
	Black. Per cent.	Galv. Per cent.	Black. Per cent.	Galv. Per cent.
⅛ and ¼ inch	67½	51½	63½	49½
⅜ and ½ inch	71½	59½	69½	57½
¾ to 6 inches	75½	65½	74	64
7 to 12 inches	70½	55½	69	53½
Extra strong, plain ends.				
⅛ to ⅜ inch	60½	48½	58½	46½
½ to 4 inches	67½	53½	65½	53½
4½ to 8 inches	63½	51½	61½	49½
Double extra strong, plain ends, ¼ to 8 inches	56½	45½	54½	43½

Boiler Tubes.—The mills report quite an active demand, especially from the railroads, and tonnage is heavier than for some time. Discounts to consumers in carloads, which are fairly well observed, are as follows:

Boiler Tubes.

	Iron.	Steel.
1 to 1½ inches	43	46
1¾ to 2¼ inches	43	58
2½ inches	48	60
2¾ to 5 inches	55	66
6 to 13 inches	43	58

Merchant Steel.—Specifications are quite heavy, but only a fair amount of new tonnage is being placed. We quote: Tire Steel, 1.65c. to 1.75c.; Smooth Finished Machinery Steel, 1.75c. to 1.85c.; Open Hearth Spring Steel, extra quality, 2.25c. to 2.50c.; Tool Steel, ordinary grades, 5¾c. to 8c., extra grades 10c. and upward. We quote Cold Rolled Shafting at 50 per cent. off in carloads and 45 per cent. in less than carloads, delivered in base territory.

Railroad Spikes.—Demand is reported quite heavy and some of the concerns are asking higher prices. We quote $1.65 to $1.70 per 100 lbs. for carload lots and $1.75 to $1.85 for small lots, f.o.b. maker's mill.

Spelter.—The Spelter market has quieted down again and the upward movement in prices has stopped. We quote Prime Western grades at 6c. to 6.05c., St. Louis, equal to 6.12½c. and 6.17½c., Pittsburgh.

Coke.—We note a very active demand for Furnace Coke for shipment over last six months of this year, and a number of contracts have been closed at prices ranging from $2.30 up to $2.50 a ton for strictly Connellsville Furnace Coke. Most contracts have been at the higher figure and it would be impossible to buy strictly Connellsville Furnace Coke today for shipment over last half of the year at less than $2.50 a ton at oven. Main Line Furnace Coke of high quality has sold at $2.25 to $2.35 a ton at oven on contracts for same delivery. There is an enormous demand for both Furnace and Foundry Coke, and output and shipments of the Connellsville region last week broke all previous records. Shipments amounted to 13,746 cars, while the output of the Upper and Lower Connellsville regions exceeded 330,000 tons. Strictly Connellsville 72-hour Foundry Coke is held at $2.75 to $3 a ton at oven. Main Line Foundry Coke is $2.50 to $2.60 a ton at oven.

Iron and Steel Scrap.—The Scrap market is quiet, leading consumers being covered, and very little new tonnage is changing hands. Dealers who have stocks of Scrap are firm in their ideas as to prices, believing that demand will soon improve. Heavy Melting Scrap is held at $16 to $16.25, but there is very little demand for it. On other grades of Scrap dealers quote as follows: Bundled Sheet Scrap, $14.50; No. 1 Wrought Scrap, $19.50; Wrought Iron Turnings, $13.50 to $13.75; Cast Iron Borings, $10.25 to $10.50; Steel Rails, short pieces, $15.75 to $16; No. 1 Cast Scrap, $15.25 to $15.50; Iron Car Axles, $22 to $23, all in gross tons, f.o.b. Pittsburgh.

Johnson & Co., 1013 House Building, Pittsburgh, Pa., have been appointed selling agents in the Pittsburgh district for the Charcoal Iron Boiler Tubes made by the Tyler Tube & Pipe Company, Washington, Pa.

The Pittsburgh Steel Company, Frick Building, Pittsburgh, with works at Monessen, Pa., manufacturer of Wire Rods, Nails, Hoops, Bands, Cotton Ties and Fencing, has opened an office at 403 Security Building, St. Louis, Mo., in charge of J. H. Hamilton, for many years connected with the Dillon-Griswold Wire Company.

New York.

NEW YORK, March 15, 1905.

Pig Iron.—A fair volume of business has been done in this district and there has been quite a good deal of activity in New England, where some very good orders have been placed. The market is firmer. We quote: Northern Iron, tidewater, $18 to $18.25 for No. 1 Foundry, $17.50 to $17.75 for No. 2 Foundry, $17 to $17.20 for No. 2 Plain and $16 to $16.50 for Gray Forge. Alabama and Tennessee Irons are quoted $17.50 to $17.75 for No. 1 Foundry and $17.25 to $17.50 for No. 2 Foundry.

Steel Rails.—The United States Steel Corporation has taken an order for 25,000 tons for the Buenos Aires & Southern Railroad, and the Maryland Steel Company has closed for about 18,000 tons for another South American road.

Cast Iron Pipe.—The situation is unchanged. Although inquiries have improved, it can hardly be said yet that the spring trade has really opened up. Prices are held firmly on the basis of $26.50 for 6 to 8 inch, in carload lots, at tidewater.

Finished Iron and Steel.—While a great deal of business is in prospect which must shortly come out, the past week has been quiet in the Bridge and Structural line. The trade is hopeful, but the waiting for business is somewhat tiresome. The most important piece of work in the Structural line in this locality is the projected Altman Building on Fifth avenue, which is getting in shape for figuring. It will take at least 7500 tons. In Plates and Bars the market is firm, but without much activity. Quotations at tidewater are as follows: Beams, Channels, Angles and Zees, 1.74½c. to 1.84½c.; Tees, 1.79½c. to 1.89½c.; Bulbs, Angles and Deck Beams, 1.84½c. to 1.94½c.; Sheared Tank Plates, 1.74½c. to 1.84½c.; Flange Plates, 1.84½c. to 1.94½c.; Marine, 1.94½c. to 2.04¾c.; Fire Box, 1.94½c. to 2.50c., according to specifications; Refined Bar Iron, 1.74½c. to 1.84½c.; Soft Steel Bars, 1.64½c. to 1.74½c.

Old Material.—The heaviest business of the week was transacted in Steel Scrap. Among the sales in this line was one block of 3000 tons. Inquiries are still in the market which have not been filled. Other transactions which have come to notice are 500 tons of Wrought Pipe, 500 tons of Stove Plate and smaller quantities of Cast Machinery Scrap. Transactions in rolling mill stock generally have been light through the dealers, but it is believed much buying has been done by consumers directly from the railroad companies. The market continues quite strong, with no special change in prices. Quotations per gross ton, New York and vicinity, are approximately as follows:

Old Iron Rails	$22.00 to $22.50
Old Steel Rails, rerolling lengths	16.50 to 17.50
Old Steel Rails, short pieces	16.00 to 17.00
Relaying Rails	20.00 to 21.00

Old Car Wheels	17.50 to	18.50
Old Iron Car Axles	22.00 to	23.00
Old Steel Car Axles	19.00 to	20.00
Heavy Melting Steel Scrap	16.00 to	17.00
No. 1 Railroad Wrought Scrap	20.50 to	21.00
No. 1 Yard Wrought Scrap	18.50 to	19.00
Iron Track Scrap	18.00 to	18.50
Wrought Pipe	14.50 to	15.50
Ordinary Light Iron	11.00 to	12.00
Cast Borings	9.00 to	10.00
Wrought Turnings	12.50 to	13.50
No. 1 Machinery Cast	16.00 to	17.00
Stove Plate	13.50 to	14.50

Competition for Mexican Trade.

DURANGO, March 9, 1905.—A few weeks ago attention was called to the methods employed by certain German manufacturers of tools to introduce their products into Mexico. It will be remembered that in the instance quoted the plan adopted to substitute goods of German make for tools of American manufacture which enjoy a well-earned reputation and are in general demand was the purchase of a sample by the representative of the foreign house and the offering, at a later date, of a tool of similar construction at a very much lower price. It is not the intention to comment upon the ethical aspect of competition carried on in this way; it is sufficient, perhaps, to say that it can hardly be expected to be permanently successful. A cheap tool, made to undersell an article whose merits have been proved by long usage, is not likely to have a very extended lease of life; indeed, the fact that it is an imitation is itself certain to prove a steadying handicap in its career. Mechanics who use tools are not usually upon the lookout for cheap imitations, nor are they much concerned about the saving of a few cents, or even dollars, in the purchase of the article which they desire. What they are concerned about is the acquisition of a tool which can be depended upon to do the special work desired of it and one which will not fail them at a critical moment. For such a tool they are always willing to pay a fair price. Corporations employing a number of mechanics are even less likely to be beguiled into the "penny wise and pound foolish" policy of buying cheap imitations of good tools sold at a higher price for the saving which will accrue to them.

The incident referred to, however, will serve to illustrate how keenly the foreign manufacturers are looking to this market, and to what lengths they will go to dislodge their United States competitors. If such tactics can be dignified by the term "competition," it surely is competition of a mean and undignified character, and, being such, need cause no grave concern. Still, there is competition of another kind in the line of iron and steel products which deserves more attention. German and Belgian manufacturers are selling considerable quantities of structural iron and steel here, which they are enabled to do on account of the low rates of freight on subsidized lines of steamers which run regularly between European and Mexican ports.

Cheap razors of German make are sold in immense numbers, American manufacturers being almost out of the race in this special field. In arms, an imitation Colt revolver of Spanish manufacture, which retails at about one-fifth of the price of the genuine article, dominates the market. It is manufactured in Bilbao or Barcelona, the makers being too modest to put their names upon it. German made cutlery and enameled kitchen ware are other lines largely sold.

Comparatively few high grade revolvers of American make are sold in Mexico, although the leading hardware houses carry samples of them, including the automatic Colt. There ought to be a market here for a good, serviceable revolver which could be retailed at a low price in competition with the article of Spanish manufacture already mentioned. J. J. D.

The 33-inch blooming mill at the New Castle Works of the Carnegie Steel Company, New Castle, Pa., recently rolled 2050 tons of 6½ x 7½ inch sheet bar blooms during a turn of 12 hours. This is a record for a mill of this size. Since its installation the mill has been doing such good work that the melting department has been unable to keep it fully supplied with steel. The mill was built and installed by the United Engineering & Foundry Company, Pittsburgh.

Alabama Consolidated Improvements.

When control of the Alabama Consolidated Coal & Iron Company, Birmingham, Ala., was secured by the International Power Company, New York, announcement was made in a general way of plans the company had in view for large improvements to its properties for the purpose of increasing its production and the manufacture of finished products. For a long time the company has been a seller of raw materials, such as ore, coke, limestone, &c., and to utilize this material it has been determined to construct another furnace at Gadsden. The new furnace, which will have every modern labor-saving device, and cost about $350,000, will be built as rapidly as possible. It will have a daily output of 200 tons of Pig Iron. Its cost will be paid for out of surplus funds now in the treasury. The low estimated cost is due to the fact that when the last furnace was built the company had in view the construction of a second stack, and many features then provided are equal to the needs of two stacks. It is intended to have the new furnace completed by January 1. In building the new furnace the company is carrying out the plans long ago formulated by President Brush to develop its iron output to a point commensurate with its resources of coal and iron ore, so that it can supply the growing demand for iron in Alabama, where it is stated there is now less foundry iron for the open market than five years ago, owing to the erection of large steel mills by one of the most important producers in that section.

On the outskirts of Birmingham, about five miles from the center of the city, the Alabama Consolidated Coal & Iron Company owns 1800 acres of land with an abundance of water, good transportation facilities and other natural advantages as a manufacturing center. On this property the company is planning to locate industries which will consume a good portion of its pig iron. While definite arrangements have not been consummated, it is practically assured that two or three engine building plants now located in the East will be concentrated in one large works on the property, and that a large locomotive plant will be erected to accommodate smaller works, some of which are at present in New England. A steel plant is also one of the possibilities of the near future. The first plant which will be an important consumer of the Alabama Company's output will be the soil pipe works now being constructed at Gadsden by the Coosa Pipe & Foundry Company, a subsidiary company of the Alabama Consolidated Company. As soon as this plant is completed its capacity will be doubled, the plans for this improvement being now under way.

At Latrobe, Pa., on March 13, final negotiations were completed for the consolidation of the Derry Coal & Coke Company, Saxman Coal & Coke Company, Latrobe-Connellsville Coal & Coke Company, Ligonier Coal & Coke Company and Superior Coal & Coke Company. The new organization will be known as the Latrobe-Connellsville Coal & Coke Company, controlling the entire Saxman interests, covering about 3000 acres of coal land with 570 coke ovens.

Governor Pennypacker of Pennsylvania has sent a message to the State Legislature calling attention to the rush for charters for water companies in that State. Dozens of companies have been incorporated within the last few months and there are charters for 25 more pending. As these companies have the right of eminent domain in their districts, the Governor deems it wise to call a halt because of the danger to manufacturing, mining and railroad interests.

The blast furnace of the Carnegie Steel Company at the North Sharon Works, North Sharon, Pa., which has been idle for about eighteen months, has again been put in blast. The 48-inch mill at this plant on which skelp is rolled was started up this week.

Metal Market.

NEW YORK, March 15, 1905.

Pig Tin.—The London market has again advanced, and the American market has responded. The advance in London is said to be partially due to the curtailment of the periodical Banca sale, as noted last week, and also to rumors of labor troubles among the coolies in the Tin mines. Aside from this sympathetic influence the American market was quiet, and there were small demands from consumers. Spot Tin is quoted to-day at from 29.37½c. to 29.70c.; future deliveries in March, 29.30c. to 29.65c.; April, 29.25c. to 29.50c.; May, 29c. to 29.35c. In the London market spot Tin is quoted at £134 17s. 6d, with future quotations at £133 15s. The arrivals during the past week were light as compared to the preceding week, a total of 1995 tons having arrived this month, with about 3220 tons afloat.

Copper.—The market for Copper is quite dull. Prices remain unchanged. This periodic dullness in the Copper market is to some extent accounted for by the fact that large consumers who combine in their purchases are out of the market at present, but it is thought that they will come forward shortly and purchase a good supply of the metal. The less important consumers are buying in small quantities and only as their immediate needs dictate. Lake is quoted 15.25c. to 15.37½c.; Electrolytic, 15.12½c. to 15.25c., and Casting Copper at 14.87½c. to 15c. London has advanced slightly, spot being quoted to-day £68 11s. 3d.; futures, £69; and Best Selected, £72 15s. The exports, so far this month, aggregate 8675 tons.

Pig Lead.—The market is quiet and unchanged, with little business. Spot stocks in this city are quoted at 4.50c. to 4.60c. The American Smelting & Refining Company continues to quote on a basis of 4.45c. for Desilverized in 50-ton lots, 30 days' shipment. St. Louis market has advanced slightly, being quoted at 4.37½c. to 4.40c. The London market remains unchanged at £12 5s.

Spelter.—The local market for Spelter is quiet, a noticeable feature of this market being that Spelter can be obtained here at figures slightly under the St. Louis figures, plus the additional freight. In St. Louis there is evidently a strong bull movement on foot, based upon the scarcity of Ores, while in New York certain large merchants are speculating, selling the market short at times. Prices have advanced slightly and Spelter is now quoted in this market at 6.15c. to 6.25c.. The St. Louis market has declined somewhat, prices ranging from $6.05 to $6.15, according to brand. The London market declined slightly to £23 17s. 6d.

Antimony.—The market is very dull and easy. Hallett's is quoted at figures ranging from 7⅞c. to 8⅛c. Cookson's is quoted 7.87½c. to 8.87½c. Other grades are from 7c. to 7.50c.

Quicksilver.—The market is slightly lower, flasks of 75 lbs. being quoted at $38. The London market is quoted at £7 12s. 6d.

Nickel.—The tone of the market is quiet and prices are practically without change, large lots being quoted at 40c. to 45c. and smaller quantities at 50c. to 60c.

Tin Plate.—A better demand exists for Tin Plate, and manufacturers are willing to pay good prices for Sheet Bars. Prices are unchanged, however, the American Sheet & Tin Plate Company quoting on a basis of $3.74 a box for 14 x 20 100-lb. Coke Plates, f.o.b. New York, or $3.55, f.o.b. Pittsburgh. The foreign market has declined 3d., Plates in Swansea being held at 11s. 7½d.

New York Pig Iron Warrant Market.

The feature of the Pig Iron warrant certificate market was the official announcement by the Pig Iron Committee of the New York Produce Exchange of amendments made to the rules this last week providing for trading in foundry, Bessemer and basic irons separately, the changes to go into effect March 20. No essential change is made in the present pig iron warrant certificate excepting in the name. It will be known in the future as the "Regular" pig iron warrant certificate and will be issued exactly as in the past. For the purpose of providing for trading in foundry pig iron and in Bessemer and basic pig iron separately there will be two additional forms of certificates issued, one to be known as the "foundry" pig iron warrant certificate and the other to be known as "the Bessemer and basic" pig iron warrant certificate. "Foundry" certificates will be issued only for warrants of foundry and forge pig iron of approved brands, and "Bessemer and basic" certificates will be issued only for warrants of Bessemer and basic pig iron, as provided in the rules. At each public call of pig iron on the Exchange "regular," "foundry" and "Bessemer and basic" certificates will be called separately.

The demand for certificates was rather quiet, the sales aggregating only 500 tons, of which 300 tons March were sold at $16.70; 100 tons April, $16.70, and 100 tons July, $16.70. The following quotations were established on call Wednesday noon:

	Bid.	Asked.
Cash	$16.50	$17.00
March	16.50	16.80
April	16.70	16.90
May	16.70	16.90
June	16.70	17.00
July	16.60	16.70

Iron and Industrial Stocks.

NEW YORK, March 15, 1905.

The market has been firm throughout the week, with the United States Steel stocks making new high records for this period. On Monday the preferred stock reached 97¼ and the common stock 37⅜, while the new 5 per cent. bonds sold at 95¼. Car & Foundry preferred also showed a sharp advance from 94⅝ to 99. During the week Tennessee Coal advanced from 87⅞ to 93⅛, and Sloss-Sheffield common from 89¾ to 91½. United States Cast Iron Pipe, common, advanced from 31⅛ on Thursday of last week to 33½ on Tuesday of this week. The whole line of iron and steel stocks has, in fact, been stimulated by the report that the United States Steel Corporation's earnings for the current quarter are expected to reach fully $26,000,000. This is taken as very strong evidence that the iron and steel trade is approaching its prosperous condition of two years since. Last transactions in active stocks up to 1.30 to-day were at the following prices: Can common 10⅜, preferred 67½; Car & Foundry common 36⅞, preferred 98⅞; Locomotive common 45½, preferred 115⅛; Steel Foundries common 16½, preferred 61; Colorado Fuel & Iron, 54¾; Pressed Steel common 38¼, preferred 91½; Railway Spring, common 35½, preferred 96¼; Republic common 20, preferred 76¼; Sloss-Sheffield common 93, preferred 125; Tennessee Coal, 91¼; United States Steel common 36⅝, preferred 96½, new 5's 95¼.

The Lookout Mountain Iron Company, Battelle, Ala., has made a first mortgage to the American Trust & Savings Bank of Birmingham, Ala., as trustee, to secure $400,000 of 6 per cent. gold bonds, dated March 1, 1905, and due March 1, 1925, but subject to call on any interest period at par if drawn by lot; interest payable September 1 and March 1 at office of trustee. The proceeds will be used for general construction. A sinking fund is provided from royalty on coal and ore mined.

An offer of $1180 per share, together with the regular semiannual dividend of $20 per share payable May 15, has been made to all stockholders of the Lowell Machine Shop, Lowell, Mass., for their shares. This offer is made by Robert F. Herrick, who withholds the names of his clients. It is understood, however, that the Saco & Petee Company, which owns a large plant at Lewiston, Maine, and another at Newton Upper Falls, Mass., has been in negotiation for the Lowell plant. Unless a majority of the shares (901) is deposited with the City Trust Company, Boston, on or before April 1, all stock will be returned to the original owners; if a majority of stock is bought, the offer will remain open to shareholders unavoidably delayed until September 1, 1905. The Lowell Machine Shop is capitalized for $900,000, par $500. The last sale of the stock was at $902½; previous to this sale the price jumped from $812 to $850 per share. For the past few years dividends have been as follows: 1904, 8 per cent.; 1903, 10 per cent.; 1902, 10 per cent.; 1901, 10 per cent.; 1900, 10 per cent.; 1899, 9 per cent.

The members of the Pittsburgh Stock Exchange are discussing the question of establishing a stock transfer office in Pittsburgh, for transfering the securities of the United States Steel Corporation. Large quantities of these securities are sold on the Pittsburgh Stock Exchange every day and it would facilitate these sales very much to have a stock transfer office in that city.

The Pittsburgh Stove & Range Company, Pittsburgh, has executed to the Fidelity Title & Trust Company the mortgage covering its issue of $600,000 20-year 5 per cent. bonds. Half a million of the bonds are to be used to retire the $1,000,000 of preferred stock at the ratio of $2000 in stock for $1000 in bonds. The trust company is the trustee for the bonds under the mortgage, and the bonds will be issued in exchange for the stock in a short time.

Dividends.—International Steam Pump Company has declared a quarterly dividend of 1½ per cent. on the common stock, payable April 1. Transfer books close March 20 and reopen April 3.

The United Shoe Machine Company has declared a quarterly dividend of 1½ per cent. on the preferred stock and 2 per cent. on the common stock, both payable April 15.

The Sloss-Sheffield Steel & Iron Company has declared the regular quarterly dividend of 1¾ per cent. on the preferred stock, and a semiannual dividend of 2½ per cent. on the common stock, both payable April 3.

The Pittsburgh Scale Company, Pittsburgh, has declared the regular semiannual dividend of 3½ per cent. on the preferred stock and an extra dividend of 4 per cent. on the common stock, making a total disbursement of 11 per cent. in dividends the past year. H. E. Grant has been re-elected president and H. A. Boschert, treasurer.

The Machinery Trade.

NEW YORK, March 15, 1905.

Indications of a slight improvement in business are apparent in almost all quarters of the trade. This means that orders are being placed more freely and that the heavy volume of inquiries which has characterized the market of late has not abated. The boiler and engine and power plant supply branches of the trade report a very healthy increase in business. The demand is coming from industrial concerns of all sorts, denoting that manufacturers of miscellaneous lines of product are preparing to meet an increased consumption. This is taken as the first sign of a rush of business which it is felt is coming like an avalanche some day not far distant. Machinery merchants realize that if the present accumulation of the tremendous volume of inquiries continues the dam of hesitancy which now holds them back must soon break, with the result that the orders will overtake the trade in an uncontrollable boom. Merchants are making every effort to forestall this and their efforts are meeting with a good deal of success. Purchasers are also appreciating the situation when it is pointed out to them and as a result are placing their orders now; hence the increased business. It is the larger concerns which know of the heavy requirements of the more important corporation which see the torrent forming and they view the situation with a good deal of uneasiness. They believe that many of the most unfavorable features of a boom market can be averted if the smaller purchasers will come forward with their orders.

Tunnel and Canal Contracts.

The contract for the construction of the Bergen Hill section of, or the New Jersey approach to, the Pennsylvania Railroad tunnel system was awarded on Monday to the John Shields Construction Company, 1 Madison avenue, New York City. The railroad stipulates that the work shall be completed in less than two years and that the successful bidder shall start at once on the undertaking. The contract is understood to amount to $2,250,000. There will be two tunnels, each about 1¼ miles long. Owing to the fact that Mr. Shields has been out of town since the awarding of the contract we have been unable to ascertain what will be done in the way of purchasing machinery equipment for the work of construction.

Contracts for three of the six sections of the New York $101,000,000 barge canal have been awarded. Two contracts, including sections 1 and 4 and amounting to almost $1,400,000, it will be recalled, were awarded a little more than a month ago to Lindon W. Bates, 74 Broadway, New York. Contract No. 2 was awarded to the Ferguson Contracting Company, 69 Wall street, for $852,330; contract No. 3 to Sundstrom & Stratton, 143 Liberty street, New York, for $670,497, and contract No. 5 was awarded also to Lindon W. Bates, 74 Broadway, New York, for $381,987.50. This leaves but one contract undisposed of—namely, contract No. 6—on which bids were received last December. The above concerns will require a great deal of machinery in order to execute their contracts.

Machinery Lists.

Although the appropriations for the entire tool and machinery programme for 1905 of the Pennsylvania Railroad Company have not been authorized, it is the general belief among the superintendents of motive power that the authorization will soon be given by the Board of Directors and the general manager. In anticipation of this authority, therefore, the Philadelphia, Baltimore & Washington Railroad Company of the Pennsylvania Railroad has requested the purchasing agent to obtain bids upon its anticipated requirements. The list is not a particularly large one this year, owing to the fact that a number of purchases were made during 1904, and the necessity for new machinery is not a pressing one on this division. The list will be issued to the tool manufacturers by the purchasing agent this week, and is made up of the following specifications: One 15-ton 3-motor electric traveling crane, one 42-inch x 12-foot planer, one 20-inch shaper, one 4-inch centering machine, mounted on bed; one 6 x 6 inch metal saw, belt driven; one 3-spindle vertical car boring machine, to work 14 x 14 inch timber; one center grinding machine, for grinding lathe centers, motor driven; one 10-ton steam locomotive crane, one 2 x 24 inch turret lathe, bar work; one 3 x 36 inch turret lathe, bar work.

E. H. Green, president of the Texas Midland Railroad, has been in New York during the last few days purchasing machinery for the road. Mr. Green's home is in Tyrrell, Texas, and it is believed in the trade that before he returns he will have placed very substantial contracts for machine shop equipment as well as additional rolling stock.

The Richmond, Fredericksburg & Potomac Railway has been in the market with a list of about $20,000 for machine tools of miscellaneous types and sizes, and has awarded its contract to the Niles-Bement-Pond Company.

The Chandler Planer Company, Ayer, Mass., which is to place upon the market a new type of planer designed especially for high speed work and possessing a new, novel style of drive in mechanism, is now about to place orders for the machinery equipment required to equip the plant. The list of machine tools which the company is in the market for is of good size and will constitute an excellent equipment for the new machine shop. Geo. J. Burns, general manager of the company, is in charge of the purchase of the tools. The list is as follows: Two 48-inch universal radial drills, one 30-inch radial drill, two 36-inch upright drills, one 20-inch gear cutting machine, one 36-inch gear cutting machine, one 16-foot grinder, one 10-foot grinder, three 24-inch water tool grinders, one 16 inch x 16 foot lathe, one 16 inch x 10 foot lathe, one 14-inch lathe, with taper attachment, 6 feet between centers; one 36-inch pulley lathe, one 28 inch x 16 foot high speed shafting lathe, two 36-inch x 10 foot lathes, one 24 inch x 10 foot engine lathe, two 14 inch x 4 foot engine lathes, one small boring mill or chucking lathe, one 6-foot boring mill, one vertical upright milling machine, one large milling machine or gear cutter, planer type; one universal milling machine, one 6 foot or 7 foot x 20 foot to 30 foot open side planer, one 48-inch planer, one 15 or 16 inch shaper, one cutting off machine up to 6 inches.

Scott & French, P. O. box 52, Knoxville, Tenn., manufacturers of repressed paving and building brick, are in the market for a rock crushing plant.

Plant Extensions.

It is announced in Philadelphia that the management of the Bethlehem Steel Corporation has decided to enlarge its Harlan & Hollingsworth plant at Wilmington, Del. Work, it is said, will be started as soon as the necessary plans and specifications can be completed. The announcement, it is said, was made by H. S. Snyder, secretary of the steel corporation, after an inspection of the Wilmington plant made with other officers of the organization. The Harlan & Hollingsworth plant, which is devoted to the construction of small deep water craft boilers and railroad cars, is working on an order for some 65 passenger coaches for the Reading Railway and has received several similar orders from other railroads, and it is principally to facilitate the production of cars that the proposed extensions are to be made. In a recent issue of *The Iron Age* a brief summary of the improvements to be made was printed, and in view of the fact that the improvements have now received the official sanction of the company rather extensive machinery purchases will doubtless be made in a short time. The Bethlehem plant is also undergoing improvements on a very large scale, as we have previously noted, and this work will continue steadily throughout the entire year. Very large purchases of machinery equipment will be made from time to time as this work progresses.

Large extensions to its plant at Bayonne, N. J., are being planned by the Babcock & Wilcox Company, builder of water tube boilers. In addition to general extensions to the machine shop general department, and the completion of new wood working and pattern shops which have been under process of construction since last September, a 300-foot addition to the wrought iron department, where seamless headers for marine boilers and similar parts are made, will be built.

The industrial enterprises in the vicinity of Birmingham, Ala., are in a fair way to be further augmented by a plant for the manufacture of cars. While it is not definitely settled the American Car & Foundry Company, St. Louis, Mo., has about decided to establish a branch works in Birmingham, which will give employment to about 2500 men.

The plant of the Connellsville Machine & Car Company, at Connellsville, Pa., builder of mining cars and mining machinery, was completely destroyed by fire on Sunday, March 12, the loss being estimated at about $50,000. The plant will be rebuilt as fast as possible, and much new equipment will be needed.

Hoists, cranes, trolleys, molders' squeezers and air compressors are required by J. Walter Miller, Lancaster, Pa., who has about completed a new building, 50 x 100 feet, which is to be used as a brass foundry to increase his capacity in that line of business. The services of J. B. Amwake, who has been in the lock business for some years, have been secured, and Mr. Miller is adding a line of lock and general shelf hardware to his manufactures. This business will be carried on in its present quarters until spring, when it is the intention to put up other buildings on the new site, the mechanical requirements for which are not yet ascertained. Mr. Miller has been conducting a general electroplating and metal finishing business for 18 years, and has been in the brass foundry business for five years, making a specialty of contract work for manufacturers in general.

Power Plant Equipment and Pumping Machinery.

The filing last week of a mortgage of $7,500,000 by the Baltimore Electric Power Company, Baltimore, Md., discloses the official plans and other details in connection with the building of a new electric light and power plant under

the franchise given to the Maryland Telephone & Telegraph Company. The mortgage is the first lien of the new electric light and power plant and the lien after the other bonds of the Maryland Telephone & Telegraph Company. These bonds will be retired. The Baltimore Electric Power Company absorbs the Maryland Telephone & Telegraph Company, as 85 per cent. of the $1,000,000 of capital stock of that company goes under the new mortgage. The Baltimore Electric Power Company has a capital stock of $2,500,000, making in all a capitalization of $10,000,000, which covers both the electric power and telephone properties. The immediate issue of the bonds of the Baltimore Electric Power Company is to be used in building a new plant, and has been underwritten by the Northern Trust Company of Philadelphia and the Central Trust Company of Baltimore. The details of the plans for the construction of a power plant for this company were published several months ago and the principal generating apparatus has just been purchased. This includes two 2500 horse-power Westinghouse steam turbines, direct connected to two 1500-kw., 6600-volt, 3-phase alternating current generators at the main station, and at the substation three 1000-kw. motor generators and one 125-kw. starting set. The boiler plant will consist of eight 600 horse-power Stirling water tube boilers equipped with Roney stokers. Both the generating station and substation will be of fire proofed steel construction. It is intended to have the plant in operation about July 1 of this year. W. J. Manigal, general manager of the electric light and power department of the Maryland Telephone & Telegraph Company, Lexington and Cortlandt streets, Baltimore, Md., is purchasing the equipment.

Hooven-Owens-Rentschler Company, 39-41 Cortlandt street, New York, has just sold a 250 horse-power Hamilton-Holzwarth steam turbine, direct connected to a Crocker-Wheeler generator, to the Mitensague Paper Company, Mitensague, Mass. This firm also sold two 250 horse-power Hamilton-Corliss engines, direct connected to electric generators, to the Wyoming Valley Gas & Electric Company, Plymouth, Pa., a 200 horse-power cross compound condensing Hamilton engine to the municipality of Farmville, Va., which is erecting a municipal lighting plant; a 300 horse-power cross compound condensing engine to the Piedmont Mills, Lynchburg, Va., and a 350 horse-power single cylinder engine to the Shantz Button Company, Rochester, N. Y.

The chairmen of the Board of Control, Toronto, Canada, will receive bids until March 21 for either a 5,000,000 or 6,000,000 gallon triple expansion fly wheel pumping engine.

Bids will be received until May 18 at the office of the Supervising Architect, Treasury Department, Washington, D. C., for the mechanical equipment for the New York Custom House.

It was decided at a special meeting of the Board of Aldermen at Batavia, N. Y., to raise $8000 to purchase two new boilers for the water works plant.

An order for more than 20 pumps of different types and sizes, but principally mine pumps, was awarded to the A. S. Cameron Steam Pump Works, New York City, by the Union Iron Works, San Francisco, Cal. Another order of importance booked this week by the Camerion Company called for several vertical plunger sinking pumps, and has been placed by S. Pearson & Sons Company, the builder of the East River section of the Pennsylvania Railroad New York tunnel system. Another good sized order for pumps, to be used for tunneling purposes, is from the Barrett Mfg. Company, which is furnishing supplies for constructing the tunnel between Battery Park, New York, and South Brooklyn. This order called for three pumps of large capacity. The Long Mead Iron Company, Conshohocken, Pa., purchased an extraordinarily large pump for installation in its rolling mill.

To Take Up New Lines.

Although it has not as yet been officially announced, there is a report in the trade to the effect that the International Steam Pump Company is about to enter the gas engine field. We understand that an order has already been received from the California Gas & Electric Corporation for three 5300 horse-power gas engines, and that the crank shafts of these engines are now being made by the Bethlehem Steel Corporation. The engines, we understand, are to be built at the Snow plant at Buffalo. It is said that in addition to the large sizes of producer gas engines, a line of engines to be operated upon blast furnace waste gases is also to be placed upon the market.

Several weeks ago a rumor circulated that the Green Fuel Economizer Company was about to enter the manufacture of blowers, heaters, fans, and, in fact, all branches of mechanical draft, blowing, heating and ventilating apparatus. The company now makes an official announcement to this effect. It also announces that H. J. Barron, the well-known heating and ventilating expert, is now in its employ and located at the New York offices of the company, 74 Cortland street. As we have also previously noted, the extensive additions to the company's plant at Matteawan are for the purpose of producing this apparatus.

The International Power Company, 74 Broadway, New York, has secured all the patent rights of the Wilkinson Turbine Company of Birmingham, Ala., and intends to produce the machine and place it upon the market. The Wilkinson steam turbine is the invention of James Wilkinson, chief engineer of the electric lighting plant at Birmingham. A large number of patents covering marine, stationary and locomotive types of the turbine have been granted in various countries. The Wilkinson Company was incorporated last October to manufacture the turbines, but none have been placed upon the market as yet. Capt. Richmond Pearson Hobson, of Santiago harbor fame, was said to be connected with the company at the time of its formation.

Agency News.

The Cleveland Planer Works, Cleveland, Ohio, a new company producing an open side planer, which was illustrated in *The Iron Age* of July 7, 1904, has appointed the Prentiss Tool & Supply Company selling agents for the various sections of the country throughout which it maintains offices.

Thayer & Co., Incorporated, selling agents for the Cahall boilers, will remove its New York headquarters from 39-41 Cortlandt street to 42 Broadway on April 1, where an elaborate suite of offices is being fitted up.

Allis-Chalmers Company of Milwaukee, Wis., U. S. A., will be represented hereafter in West Australia by F. R. Perrot, and in New Zealand by the firm of John Chambers & Son, Limited. Mr. Perrot's headquarters are at Perth, West Australia, and those of John Chambers & Son, Limited, are at Auckland.

Catalogues Wanted.—The Western Iron Works, Incorporated, manufacturers of gas, gasoline and oil engines, Los Angeles, Cal., will double the capacity of its plant, and it is desirous of receiving catalogues with price-lists from manufacturers of all types of machinery used in the production of gas engines. A complete foundry equipment will also be purchased.

New England Machinery Market.

WORCESTER, MASS., March 14, 1905.

If there has been any change in the demand for machine tools and other shop equipment in New England during the past week it is for the better. Reports are encouraging, though business is not by any means booming. Small lots are the rule. There is a lively demand for second-hand tools, of which there are a plenty in the market. It is significant that every one expects better business now that the snow is disappearing. The country neighborhoods have been more or less isolated during the hard, long winter, and the farmers are only just beginning to do their spring trading, so that the impetus to general trade that comes under such conditions is about to be felt, which will reflect upon general manufacturing and indirectly upon the demand for new equipment. The machinery men are keenly alert to the demands of the navy yards at Charlestown and Portsmouth, which are expected to want a good deal of machinery and other manufacturing equipment this spring.

The Wheeler Foundry Company has been incorporated to take over the foundry business of Edgar B. Pierce, Worcester, Mass., one of the oldest foundries in New England, dating back to 1825. The officers of the corporation are: President, Edgar B. Pierce; clerk and treasurer, Elisha Tolman; general manager, Richard P. Power. The incorporation is a reorganization, Mr. Power succeeding Mr. Pierce as manager of the business. Mr. Pierce will soon sail for Europe for a long pleasure trip.

The Chapel Mills Mfg. Company, Cherry Valley, Leicester, Mass., is to build a new power plant, in which will be installed a new 300 horse-power engine and two boilers of 125 horse-power each. The boiler contract has been awarded the Stewart Boiler Works, Worcester, Mass., but no decision has been reached regarding the engine. A three-story addition, 60 x 120 feet, will be erected.

The Goodell-Pratt Company, manufacturer of mechanics' tools, Greenfield, Mass., is to erect a new building this season for japanning and hardening purposes. It will be 42 feet square and three stories. Because of its purpose it will be built of cement reinforced by twisted steel rods, and will have galvanized iron window frames with wire glass windows, the whole design being with a view to making the building as entirely fire proof, as it is possible to construct a structure of this kind.

The George A. Judson Company, Rochester, N. H., manufacturer of textile machinery, will remove its shop to Worcester, Mass., a lease having been taken of a part of one of the Merrifield buildings, 5 to 15 Cypress street, where 5000 square feet of factory space is available. George A. Judson, head of the company, was located at Lowell, Mass., for a number of years, and five years ago sold out his business there and established shops at Rochester. It is understood that the removal to Worcester will mean an increase in manufacturing facilities.

The Vanholdon Mfg. Company, 75 Westminster street, Providence, R. I., has been incorporated in Rhode Island with authorized capital stock of $25,000, to manufacture the Holt safety gas cock. A factory will be established, probably in Woonsocket, R. I. The officers are: President, Zeuner M. Jenks, superintendent of the Woonsocket Gas

Company; vice-president, Robert F. Linton; secretary, John T. L. Donavan; treasurer, William H. Holt.

The Turners Falls Water Power Company, Turners Falls, Mass., will build a new power house, 63 x 130 feet, for the development of electric power. The Turners Falls Machine Company will furnish the turbine wheels and a Bullock electric generator will be installed.

The William T. Bonner Company, successor to William T. Bonner & Co., Boston, Mass., has been incorporated under Massachusetts laws, with capital stock of $50,000, to manufacture and deal in engineering appliances. The officers are: President, William T. Bonner, Boston; treasurer and clerk, Lewis H. Homer, Brookline, Mass.; directors, these officers and A. E. Cox, South Boston; H. S. Chase, Newton, and William S. Hatch, West Newton, Mass. The company will continue the manufacture of the Klinger Reflex water gauges and Wiltbonco gauge mountings, manufactured by William T. Bonner & Co., and in addition will manufacture a line of valves designed by Mr. Bonner and other engineering appliances especially adapted for use in connection with steam, water and gas plants. The company will establish a shop for doing its own manufacturing, the general offices, shop and salesroom to be located at 244, 246 and 248 Summer street.

The Union Metallic Cartridge Company, Bridgeport, Conn., is to make several additions to its factory, including a fulminate building, 23 x 30 feet; a storage building, 70 x 100 feet; cap drying room, 28 x 70 feet, all one-story; and a two-story building, 18 x 24 feet.

The Bristol Specialty Company, Bristol, Conn., has awarded the contract for the new plant at Terryville. The wood working tools and other equipment which will be required have not yet been ordered. The factory will be operated by water power.

J. H. Sessions & Son, manufacturers of trunk hardware, Bristol, Conn., are considering the erection of a new factory on property which they acquired some time ago. They are now occupying the Codling factory, lately occupied by A. H. Warner & Co. as an addition to their plant.

Chicago Machinery Market.

CHICAGO, ILL., March 14, 1905.

The comparatively large volume of business that is being done in machinery consists mainly of a mass of relatively small orders. Meanwhile many large propositions which have been occupying the attention of machinery builders and sellers are hanging fire. Makers of small engines and boilers, for instance, are busy, while the large engineering firms are experiencing a decided let down from the pace of December and January.

The Southern Indiana Railroad, which is owned by John R. Walsh, the president of the Chicago National Bank, and his associates in the Bedford Quarries Company and important coal interests in southern Indiana, is making rapid development of its 340 miles of road. Large shops will be built at Terre Haute, Ind. These shops will include ten buildings, as follows: Machine shop, 220 x 400 feet; passenger coach repair shop, 180 x 200 feet; freight car repair shop, 180 x 400 feet; power house, 100 x 100 feet; blacksmith shop, 80 x 120 feet; boiler shop, 80 x 140 feet; storehouse, 80 x 240 feet; office building, 50 x 90 feet; engine house, 225 x 430 feet; oil house, dry kilns, planing mill and other structures. Jenney & Mundie, Chicago, are the architects who prepared plans for these buildings. The same architects have designed additions and changes in the shops and power plant of the road at Hulman street, Terre Haute, and Bedford, Ind. General offices of the Southern Indiana Railroad are in the Grand Central Station, Chicago.

The Cincinnati, New Orleans & Texas Pacific Railway Company has let contract to the Pittsburgh Construction Company for the building at Somerset, Ky., of an erecting machine shop, boiler shop and blacksmith shop, 171 x 334 feet; power house, 60 x 90 feet, and storehouse, 60 x 100 feet. G. B. Nicholson, Cincinnati, Ohio, is chief engineer.

The Illinois Central Railroad Company is making active preparations for rebuilding the terminals at New Orleans which were destroyed by fire February 26. The fire devastated a large area on the dock front at New Orleans, including three large warehouses, two grain elevators and almost a mile of dock frontage. Several thousand men are now at work clearing away the *debris*, and plans are being drawn up for rebuilding the terminal facilities on a larger scale than before. It is not yet known what the machinery and iron and steel requirements will be for this work, but they will be extensive. The same fire destroyed some 325 freight cars, which will be rebuilt. In rebuilding this plant the railroad company will make adequate provisions for the requirements of Pacific Ocean traffic, which before many years will reach the United States via the Panama Canal.

The Wheeling & Lake Erie Railroad Company has ordered from the Allis-Chalmers Company's electrical department, the Bullock Electric Mfg Company, Cincinnati, equipment for its new machine and car repair shops at Canton, Ohio, consisting of two engine type 250-volt generators and 16 motors with capacities aggregating 300 horse-power.

The Chicago & Northwestern Railway Company has placed an order with Allis-Chalmers Company of Milwaukee for two Reliance 32 x 36 inch belted engines and two 250-kw. direct current Bullock generators. These will be installed as two separate units in the power house of the company at Buxton, Iowa, and used for driving machinery in the coal mines there, which furnish fuel for some of the western divisions of the road.

The new manufacturing plant of Winslow Brothers Company, builder of ornamental iron work, Chicago, will comprise six buildings, one and two stories, covering 175,000 square feet of floor space. It will be built on a tract of land bounded by Forty-sixth and Forty-seventh avenues and Van Buren and Harrison streets, and will cost $150,000 to $200,000. Raeder & Coffin, Schiller Building, Chicago, are the architects. Contracts for machinery are not yet placed, as far as can be learned.

Schwarzschild & Sulzberger, Union Stock Yards, Chicago, have under construction several large buildings. One of them will be a four-story beef cooler, 160 x 240 feet, costing $550,000, built of brick and stone, in connection with their plant in Chicago. An eight-story cold storage building, 136 x 136 feet, costing $100,000, and a six-story canning factory, 100 x 100 feet, costing $65,000, will be built at Kansas City, Mo. The old eight-story cold storage building, 400 x 600 feet, at the stock yards, Chicago, which was destroyed by fire early this year, is to be rebuilt. The loss on this plant is estimated at $300,000. A new four-story cold storage building will be built at the plant in Chicago. It will be 120 x 168 feet, and cost $160,000. The general contract for this last named building has been awarded to R. & S. Sollitt, contractors, Chicago. All work is being undertaken under the supervision of the company's chief engineer, L. Levy.

The George Whiting Company, machinery manufacturer, Chicago, will remove May 1 from its present plant at 428 to 448 North Halsted street to its new works at 156 to 164 W. North avenue.

The United States Gypsum Company, 200 Monroe street, Chicago, has let the general contract for a manufacturing plant to A. H. Hanson, 323 Ninnety-second street, Chicago. The new plant, which will cost $75,000, will be at Robey street and Blue Island avenue.

Power Plants and Water Works.

The city of Alpena, Mich., will receive proposals until March 23 for its water works and electric light plant, as follows: Two 3,000,000-gallon pumping engines, four 200 horse-power boilers, 44,400 feet of cast iron pipe from 6 to 24 inch, 2000 feet of 40-inch riveted steel pipe annd 300 feet of 16½-inch riveted steel pipe, 15 tons of pig lead, two 300-kw. turbine units, 40 5-kw. transformers, two compound condensing engines, 181 gate valves, 6 to 30 inches; 50 hydrants, 12 tons of No. 4 B. & S. insulated copper wire; heaters, steam pipes, steam valves, insulators, lightning arresters, &c.; 150 2000 candle-power arc lamps and sectional switchboards. Bids will be received for installing this equipment as well as furnishing it and will include the erection of a pumping and electric light station, the building of a submerged crib, influent conduit and pump well. R. J. Crable is the city recorder in the city of Alpena.

George W. Sturtevant, Chicago, has completed plans for a complete water and sewerage system for the city of Manistique, Mich. This is a water power proposition and will require a 150 horse-power turbine, triplex power pump direct connected to the turbine shaft, together with other machinery necessary for plants of this kind, and will call for about 8 miles of water pipe and 5 miles of sewer pipe. Mr. Sturtevant is also perfecting plans for rebuilding the water works plant at Deming, New Mexico. This plant will require three 30 horse-power oil burning engines, two 1,000,000-gallon cylindrical pumps and a steel stand tower with 40,000,000-gallon steel tank.

Osborne, Kan., is in the market for a 15 horse-power engine, a 20 horse-power boiler, a 100-foot steel tower and an 80,000-gallon tank. J. A. Fouts is city clerk.

The Ford Mfg. Company, maker of roofing material, 109 West Madison street, Chicago, is in the market for two 100 horse-power boilers for its Vandalia (Ill.) plant.

The United States Brick Corporation, Michigan City, Ind., is in the market for a 150 horse-power boiler and a 100 horse-power engine. The company is erecting a plant for the manufacture of sand lime brick. The main building will be 80 x 160 feet in size.

Beyer Brothers, owners of the electric light plant at Morton, Ill., are in the market for one 150-kw., 220-volt second-hand generator and one 16 x 27 x 16 Westinghouse compound engine in first-class condition.

The Wisconsin Light & Power Company will build a $200,000 power plant at La Crosse, Wis. Jacob Cloos, Matthews Building, Milwaukee, Wis., is consulting engineer for the company.

The Kankakee Interurban Riverview Railway Company, Kankakee, Ill., is considering the proposition of building 25 miles of interurban track connecting the cities of Kankakee, Waldron, Momence and St. Anne, as well as taking over and remodeling 14 miles of city and suburban track, with a central power station at Kankakee. H. T. Bonfield, Kankakee, who is president of the road, writes that estimates are being compiled and specifications prepared, and that catalogues and prices are desired from the trade.

The Lawrenceburg Electric Light Company has been formed at Lawrenceburg, Ky., and will immediately erect an electric light plant. J. M. Johnson is president, and C. A. Leathers secretary of the company.

The Public Water Power & Heating Company, Indianola, Iowa, will expend about $25,000 in improvements to its plant, which will include the purchase of pumps and filters. J. M. Harlan is president of the company.

Plans for an important water power development at Columbus, Neb., have been practically completed by George W. Sturtevant, Fisher Building, Chicago. These plans include a deflecting dam in the Loup River, a power canal 80 feet wide at bottom, 16 miles long, at the terminus of which is to be a power house. The initial installation of power equipment will call for six 3000-kw. turbo generator sets of the horizontal shaft type to work under a 112-foot head. This power plant will furnish electrical power to Omaha, 75 miles distant, Lincoln and other points in eastern Nebraska.

The turbo generator exciter sets required by the Chicago sanitary district for the water power plant at Lockport, Ill., in the drainage canal were purchased from the Crocker-Wheeler Company, Ampere, N. J. The amount of this company's bid, which was the lowest, was $101,366.

The 20,000,000-gallon pumping engine for the Sixty-eighth street pumping station, Chicago, was awarded to the Snow Steam Pump Works, Buffalo, N. Y., for $39,000.

The Edison Sault Electric Company, Sault Ste. Marie, Mich., is building a water power plant utilizing about 3000 horse-power. Contracts for the construction of penstocks and head works have been placed subject to the arrangement of details. Alexander Dow, Detroit, Mich., is president of the company.

The Memphis Artesian Water Department, Memphis, Tenn., awarded the following contracts March 7: Five electric alternating motors for operating pumps at the water department, Westinghouse Electric Company; 1000 5 to 8 inch meters, Neptune Meter Company; 1000 Fridents meter boxes. Blacklock Foundry Company, South Pittsburg, Tenn.

Contracts were let March 8 by the Board of Supervisors at Des Moines, Iowa, for work on the court house building in that city as follows: Electrical work, Berggren Electrical Company, $6095; ornamental iron work, Twin City Iron & Wire Company, $24,980; carpenter work, Chas. Weitz & Son, $34,717; plaster, W. S. Fraley, $41,500; art glass, Allward Art Glass Company, $2000.

The Zion City Building and Manufacturing Association, Zion City, Ill., has placed orders for the following equipment for its electric light plant: One 500 horse-power McEwen engine direct connected to a General Electric 300-kw. arc circuit, three-phase, 60-cycle generator; two 100-kw. motor generators made by the General Electric Company, and two 250 horse-power Cahall boilers. The association still requires a switchboard. Burton C. Dinius is manager of the electrical and power departments at Zion City.

Chapin & Gore, Chicago, have purchased from Allis-Chalmers Company three Reliance engines and three generators for direct connection to them, complete with switchboard, &c., to be installed as a plant for electric light and power used in the Majestic Theatre and office building in that city.

Bids will close March 20 on a massive three-story and attic banking building for the Northern Trust Company, Chicago. The general contract, which is then to be let, will include the power, heating, lighting and machinery equipment. The building is to cost $1,000,000. Frost & Granger, Chicago, are the architects.

Philadelphia Machinery Market.

PHILADELPHIA, March 14, 1905.

The past week has developed some quite satisfactory business in the local machinery market. While there has been no particular increase in demand for any special line of tools or machinery, there has been a good day to day general business, which has been gratifying to both the manufacturer and dealer.

Weather conditions are becoming more favorable for outdoor work, which is quite a factor in the trade. Operations on the Philadelphia Rapid Transit Company's subway and elevated railway, which have been largely held up for some months owing to severe weather, have again been actively started, and as the weather becomes more settled improvements long contemplated by a number of plants will be pushed forward. Inquiries for general equipment for this deferred work have been on the market in varying quantities, but in many cases have not as yet been closed. The past week has brought out inquiries for several fair sized equipments, some for shops in the textile trades, others for general machine shops. The railroads, on the whole, are withholding specifications for machinery or tools in any quantity; some small orders have been placed recently and it is expected that larger specifications will be out before a great while. Specifications for locomotives for the Baltimore & Ohio Railroad are out, but at this writing it is understood that no orders have been placed. The city of Baltimore is expected to open bids for machinery and tools for its water works to-day; the requirements include a number of lathes, drill presses, &c., on which local parties have made bids.

Some manufacturers have taken on enough business recently to tax their capacity for several months ahead and it is not infrequent that 60 and 90 day deliveries are specified on certain sizes of standard tools. Special tools are in good demand, particularly of the heavy class. Heavy tool manufacturers keep, as a rule, the most active; some of the smaller manufacturers, however, have taken on a good amount of business, while, as a rule, dealers have been fairly well satisfied with the week's volume of trade.

Henderson & Co., Limited, contractors, are taking bids on a coal pocket of 400 tons capacity and a machine shop for the Absecon Power Company, Atlantic City, N. J. The machine shop is to be of brick and wood, 29 x 33 feet, two and a half stories high. The class of machinery to be installed, they advise us, will be in the nature of tools for general repair work.

The Baum Separator & Machine Company, Manheim, Pa., will as soon as the weather permits begin operations on an extension to its plant. Whether any additional machinery will be required has not as yet been determined. It will, however, be in the market for a cupola, about 48-inch shell and a blower, either fan or positive pressure, for use with same.

The Hoist Mfg. & Construction Company has recently been formed and incorporated under the laws of Pennsylvania, capital $10,000. H. J. Bur is president, and S. J. Magarge, secretary and treasurer. The new company will manufacture a spur geared chain, block hoist of special design; overhead tramway systems and special machinery. Its present plant is located at 310-314 North Seventeenth street, where most of the machinery required has already been installed. A speed lathe and some minor tools may, however, be purchased in the near future.

The High Duty Saw & Tool Company, Eddystone, Pa., has been incorporated at Harrisburg, the incorporators being Adam Tindel, L. L. Morris, Lincoln W. Gruber, Otto Albrecht and William Stoll, Jr. The capital is $50,000, and the purpose of the company is the manufacture of the Tindel high duty metal cutting saw blades and high powered sawing machines on which they are to be used. These saws are the invention of Mr. Tindel and have been thoroughly tested and used by the Tindel-Morris Company in its forging business for the past three years. Their merit was such as to induce the incorporation of the new company for the purpose of manufacturing them for the market as a distinct enterprise. The officers of the company are: Adam Tindel, president and treasurer; L. I. Morris, vice-president; Lincoln W. Gruber, secretary.

The American Pulley Company advises us that business has improved recently to a considerable extent; there has been no boom in the demand for pulleys, but orders received are for larger quantities, and are also being received with more frequency. This is true of the foreign as well as the domestic demand. Shipments in quantity have been made to Australia, New Zealand and to some European countries. In this country there has been a marked gain in new business from the South and from the Middle Atlantic States.

The Baldwin Locomotive Works has recently booked orders for ten engines from the Lehigh Valley Railroad. Three of these are of the passenger type, the remaining seven being switching engines. A number of orders for locomotives for industrial concerns have been taken, and there is also a good demand for electric engines, a number of which are building for various parties. The Baldwin Company has not been in the market recently for any extensive line of machinery or tools, but has now under considerat'on quite large purchases, on which, however, it says bids will not be generally asked.

The Link-Belt Engineering Company reports an increasing demand. Inquiries have improved materially, particularly for coal handling machinery, and the estimating department is extremely busy. Orders have recently been booked for extensive cane handling machinery for e port to Cuba. The company will also install for the Keystone Coal & Coke Company, Greensburg, Pa., a system of coal elevating machinery and has received an order for a large retail coal pocket to be erected at Syracuse, N. Y., for the Delaware, Lackawanna & Western Railroad. General business conditions are considered by them to be most favorable for future trade.

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 13, 1905.

Activity in machinery circles is much more noticeable than has been the case for a month or six weeks previously. The shops almost without exception have booked considerable business during this period, and are estimating on several large contracts that they expect to secure during the coming week. Probably the largest order received during the week was from a large steel plant in eastern Pennsylvania, and included lathes, milling machines, shapers, planers, upright and radial drills. This order represents the expenditure of about $60,000 and was distributed among several of the larger builders of the respective tools. Prices are reported as holding very strong; in fact, we learn of an advance of 5 per cent. having been made by one or two of the larger concerns. Demand for structural iron is also on the increase, and, according to indications, will still further strengthen. Cincinnati, according to reports compiled, leads American cities in the percentage of increase in building operations for the month of February. The total construction shows 47% per cent. increase over February, 1904. During February, 1904, 205 buildings were erected, at a cost of $122,260, while the same month in 1905 shows 333 buildings under way, at a cost of $683,705. Not only will the structural people feel the influence of this movement in the building line, but the good effects will be felt by manufacturers generally. Another very important factor in the development of the city, and at the same time of benefit to the builders of machinery, is the network of interurban lines that are rapidly finding an entrance to the city. The Cincinnati, Milford & Loveland Traction Line is now at work on extension of its line, which will embrace a complete outfit for power plant when completed. This plant will be equipped with two 500-unit machines, two engines, pattern not as yet decided upon, and the necessary pumps and condensers. The Allis-Chalmers Company has the contract for furnishing the motors for five new cars now being built by the American Car & Foundry Company. The Cincinnati & Columbus Traction Company has recently erected a new power plant, situated about 17 miles from this city, at Colmon station. This plant is equipped with two 1250 horse-power Cooper Corliss cross compound engines, being direct connected to an 800-kw. General Electric Company's generator, generating a current of 370 volts, 94 revolutions per minute. In the boiler room are three batteries of two Cahall type water tube boilers of 350 horse-power each. The water for Wheeler condenser is furnished by a Worthington centrifugal pump, with a Smith-Vale triplex pump for auxiliary purposes. All pumps, including air pumps, fans for American stokers and exhaust fans for Green fuel economizer, are motor driven. This 370-volt current is stepped up to 33,000 volts by oil cooled transformers, General Electric Company's design. There is in the station a 450-kw. rotary converter and there are three substations each with a 450-kw. converter and oil cooled current transformers, together with a portable substation with the same rotary and air blast transformers. The object of the portable rotary station is to be able to have it take the place of any of the other stations on the line in case of a break down or overload at any point on the line. The new car equipment is being built by the Jewett Car Company of Newark, Ohio, and will be mounted on Peckham trucks, with a motor capacity of 300 horse-power multiple control.

Industrial Notes.

The D. E. Williams Valve Company has now settled in its new plant at the corner of Broadway and Eggleston avenue and reports an excellent condition of business. The building occupied is three stories high and the machinery equipment is distributed over these floors. This new equipment consists of three Lodge & Shipley 16-inch lathes, two milling machines from the Cincinnati Milling Machine Company, three drill presses of the Cincinnati Machine Tool Company make and one of the American Tool Works, four emery wheels, five Warner & Swasey lathes, two milling machines of same make, one American Tool Works speed lathe, planer, saw and wood lathe from the J. A. Fay & Egan Company, one air compressor, Herron & Bury, Erie, Pa.; a 150 H.-P. L. & E. Greenwald engine with a 175 horse-power Tudor boiler, besides other tools that have been purchased and have not yet reached here. This also includes a full blacksmithing outfit, foundry equipment and drafting rooms. The company is in the market for a new electric light plant and will also need additional machine tools in the near future, as it is its intention to very materially increase the size of its plant and steps have already been taken to this end.

The Cincinnati Punch & Shear Company reports a falling off of orders. In the issue of *The Iron Age* for February 9 an error was made in the mention of some shipments that the company had made to a foreign field. This article should have read that it made a shipment of a large boiler punch with a 48-inch throat weighing 30,000 pounds and also a 22-foot boiler roll weighing 30,000 pounds for bending locomotive boiler iron. These machines were both motor driven and were for the National Commutator Railway Company.

The Dreses Machine Tool Company advises that export trade is on the ascendancy and that home consumption is also very much better than it has been. Last week it shipped a carload of machinery to Russia, presumably for Government work, and it has another order for four radial drill presses from the same source.

The Cincinnati Planer Company is to-day shipping six planers to Japanese points, and in addition to this reports that foreign business generally is much better. The company has added some new machines to its equipment, and is very sanguine as to the future.

The firm of Schumacher & Boye is at the present time engaged in supplying a good demand from domestic sources. A fair amount of foreign inquiry is also reported.

Greaves, Klusman & Co. think that the weather conditions have had much to do with the unsatisfactory condition of trade for the past month. However, March is showing great improvement over February and bids fair to be a very satisfactory month.

The Queen City Machine Tool Company says that it is way behind in orders, especially domestic. The company is about ready to place on the market a 24-inch shaper, and will in the near future also have one 20-inch. It is thinking very seriously of adding to its equipment, as the present facilities are proving too small.

The Loveland Foundry Company has been incorporated with $30,000 capital by Daniel Donnelly, Harry Donnelly and S. E. Brackman. D. Donnelly will be president and E. Donnelly secretary and treasurer. They will make gray castings, sash weights and machine castings. The cupola will have a capacity of about 8 tons daily, with a building, 75 x 85 feet, at the junction of the B. & O. S. W. and Pennsylvania tracks. The company expects to be ready for operation by April 1.

Building permits have been issued for a four-story brick and concrete pattern building for the John B. Morris Foundry Company to cost $30,000.

The Mansfield (Ohio) Railway, Light & Power Company, which is completely revamping its power plant, has placed an extensive order for the necessary machinery, including one 250-kw. Bullock generator, one 500-kw. and one 600-kw. railway generator, one 125 horse-power motor and one motor generator set. The contract goes to Allis-Chalmers Company, which will construct the apparatus at its electrical works in Cincinnati.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 14, 1905.

The machinery business seems to be spasmodic here at present. Three weeks ago quite a decided improvement was noticed, but during the past ten days it has been somewhat quieter. There are plenty of inquiries and a good deal of talk about additions.

The Mahoning Foundry & Machine Company, Youngstown, which has purchased the punch and shear business of the George B. Sennett Company, and which was formerly conducted by the Reade Machinery Company of Cleveland, informs us that it expects to increase the range of this line of tools. It is the expectation to produce these from the light Class 3 tool, which will punch ⅝-inch hole in a ⅝-inch plate and shear 4 x ¾ inch bar, to the heavier Class 7 tool, which will punch 1⅛-inch hole in a 1-inch plate and shear 7 x 1 inch bar, ranging in depth of throat from 8 to 58 inches, and weighing from 4800 to 38,000 pounds, carrying all these regularly in stock. These tools will be made either single or double. The company will also manufacture alligator shears and "Danielson's" line of power presses. It will increase the capacity of its plant by installing new machinery, including a horizontal motor driven boring mill of 36-inch traverse, vertical travel of saddle 5 feet, and the column to have a travel of 8 feet with a spindle 4½ inches.

One of the most important of the new projects is that of the Bear Foundry Company, which will erect a large foundry at Bedford, south of Cleveland, for the production of stove castings. The company has been in process of formation for some time and will organize and place contracts for buildings this week. Paul Schneider and D. Edward Dangler, prominently identified with the American Stove Company, are on a committee to place contracts for buildings and equipment. The statement is made, however, that the American Stove Company is not interested in the project. Kaltenbach & Griess of Cleveland, who have a large plant at Bedford, have plans for the plant. The main foundry building will be 180 x 400 feet; finishing department, 50 x 275 feet, and the pattern storage building, 40 x 40 feet. Other buildings will probably be erected, including a power house and machine shop.

The American Machine & Mfg. Company, which does machinery contract work of all kinds, has moved into a plant at the corner of the Lake Shore & Michigan Southern Railway and East Madison avenue. It has 5 acres of property and its present quarters embrace 12,000 square feet.

It has recently added considerable machinery to its equipment and will purchase more in the near future.

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WASHINGTON, D. C., March 14, 1905.

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The Bureau of Supplies and Accounts, Navy Department, Washington, will receive bids until April 11 for the following machine tools for the Portsmouth, Boston, League Island and Norfolk navy yards. Schedule 106—upright drill, emery grinders, air compressor, motor drive outfits, planer, bolt

Cincinnati Machinery Market.

CINCINNATI, OHIO, March 13, 1905.

Activity in machinery circles is much more noticeable than has been the case for a month or six weeks previously. The shops almost without exception have booked considerable business during this period, and are estimating on several large contracts that they expect to secure during the coming week. Probably the largest order received during the week was from a large steel plant in eastern Pennsylvania, and included lathes, milling machines, shapers, planers, upright and radial drills. This order represents the expenditure of about $60,000 and was distributed among several of the larger builders of the respective tools. Prices are reported as holding very strong; in fact, we learn of an advance of 3 per cent. having been made by one or two of the larger concerns. Demand for structural iron is also on the increase, and, according to indications, will still further strengthen. Cincinnati, according to reports compiled, leads American cities in the percentage of increase in building operations for the month of February. The total construction shows 453 per cent. increase over February, 1904. During February, 1904, 205 buildings were erected, at a cost of $123,260, while the same month in 1905 shows 313 buildings under way, at a cost of $681,705. Not only will the structural people feel the influence of this movement in the building line, but the good effects will be felt by manufacturers generally. Another very important factor in the development of the city, and at the same time of benefit to the builders of machinery, is the network of interurban lines that are rapidly finding an entrance to the city. The Cincinnati, Milford & Loveland Traction Line is now at work on extension of its line, which will embrace a complete outfit for power plant when completed. This plant will be equipped with two 500-unit machines, two engines, pattern not as yet decided upon, and the necessary pumps and condensers. The Allis-Chalmers Company has the contract for furnishing the motors for five new cars now being built by the American Car & Foundry Company. The Cincinnati & Columbus Traction Company has recently erected a new power plant, situated about 17 miles from this city, at Cohoon station. This plant is equipped with two 1250 horse-power Cooper Corliss cross compound engines, being direct connected to an 800-kw. General Electric Company's generator, generating a current of 370 volts, 94 revolutions per minute. In the boiler room are three batteries of two Cahall type water tube boilers of 350 horse-power each. The water for Wheeler condenser is furnished by a Worthington centrifugal pump, with a Smith-Vaile triplex pump for auxiliary purposes. All pumps, including air pumps, fans for American stokers and exhaust fans for Green fuel economizer, are motor driven. This 370-volt current is stepped up to 33,000 volts by oil cooled transformers, General Electric Company's design. There is in the station a 450-kw. rotary converter and there are three substations each with a 450-kw. converter and oil cooled current transformers, together with a portable substation with the same rotary and air blast transformers. The object of the portable rotary station is to be able to have it take the place of any of the other stations on the line in case of a break down or overload at any point on the line. The new car equipment is being built by the Jewett Car Company of Newark, Ohio, and will be mounted on Peckham trucks, with a motor capacity of 300 horse-power multiple control.

Industrial Notes.

The D. T. Williams Valve Company has now settled in its new plant at the corner of Broadway and Eggleston avenue and reports an excellent condition of business. The building occupied is three stories high and the machinery equipment is distributed over these floors. This new equipment consists of three Lodge & Shipley 16-inch lathes, two milling machines from the Cincinnati Milling Machine Company, three drill presses of the Cincinnati Machine Tool Company make and one of the American Tool Works, four emery wheels, five Warner & Swasey lathes, two milling machines of same make, one American Tool Works speed lathe, planer, saw and wood lathe from the J. A. Fay & Egan Company, one air compressor, Herron & Bury, Erie, Pa.; a 150 H.-P. I. & E. Greenwald engine with a 175 horse-power Tudor boiler, besides other tools that have been purchased and have not yet reached here. This also includes a full blacksmithing outfit, foundry equipment and drafting rooms. The company is in the market for a new electric light plant and will also need additional machine tools in the near future, as it is its intention to very materially increase the size of its plant and steps have already been taken to this end.

The Cincinnati Punch & Shear Company reports a falling off of orders. In the issue of *The Iron Age* for February 9 an error was made in the mention of some shipments that the company had made to a foreign field. This article should have read that it made a shipment of a large boiler punch with a 48-inch throat weighing 30,000 pounds and also a 12-foot boiler roll weighing 30,000 pounds for bending locomotive boiler iron. These machines were both motor driven and were for the National Tehuantepec Railway Company.

The Dreses Machine Tool Company advises that export trade is on the ascendancy and that home consumption is also very much better than it has been. Last week it shipped a carload of machinery to Russia, presumably for Government work, and it has another order for four radial drill presses from the same source.

The Cincinnati Planer Company is to-day shipping six planers to Japanese points, and in addition to this report that foreign business generally is much better. The company has added some new machines to its equipment, and is very sanguine as to the future.

The firm of Schumacher & Boye is at the present time engaged in supplying a good demand from domestic sources. A fair amount of foreign inquiry is also reported.

Greaves, Klusman & Co. think that the weather conditions have had much to do with the unsatisfactory condition of trade for the past month. However, March is showing great improvement over February and bids fair to be a very satisfactory month.

The Queen City Machine Tool Company says that it is way behind in orders, especially domestic. The company is about ready to place on the market a 24-inch shaper, and will in the near future also have one 20-inch. It is thinking very seriously of adding to its equipment, as the present facilities are proving too small.

The Loveland Foundry Company has been incorporated with $10,000 capital by Daniel Donnelly, Harry Donnelly and S. H. Bruckman. D. Donnelly will be president and H. Donnelly secretary and treasurer. They will make gray castings, sash weights and machine castings. The cupola will have a capacity of about 8 tons daily, with a building, 75 x 85 feet, at the junction of the B. & O. S. W. and Pennsylvania tracks. The company expects to be ready for operation by April 1.

Building permits have been issued for a four-story brick and concrete pattern building for the John B. Morris Foundry Company to cost $10,000.

The Mansfield (Ohio) Railway, Light & Power Company, which is completely revamping its power plant, has placed an extensive order for the necessary machinery, including one 250-kw. Bullock generator, one 500-kw. and one 600-kw. railway generator, one 125 horse-power motor and one motor generator set. The contract goes to Allis-Chalmers Company, which will construct the apparatus at its electrical works in Cincinnati.

Cleveland Machinery Market.

CLEVELAND, OHIO, March 14, 1905.

The machinery business seems to be spasmodic here at present. Three weeks ago quite a decided improvement was noticed, but during the past ten days it has been somewhat quieter. There are plenty of inquiries and a good deal of talk about additions.

The Mahoning Foundry & Machine Company, Youngstown, which has purchased the punch and shear business of the George B. Sennett Company, and which was formerly conducted by the Reade Machinery Company of Cleveland, informs us that it expects to increase the range of this line of tools. It is the expectation to produce these from the light Class 3 tool, which will punch ¾-inch hole in a ¾-inch plate and shear 4 x ¾ inch bar, to the heavier Class 7 tool, which will punch 1½-inch hole in a 1-inch plate and shear 7 x 1 inch bar, ranging in depth of throat from 8 to 54 inches, and weighing from 4600 to 34,000 pounds, carrying all these regularly in stock. These tools will be made either single or double. The company will also manufacture alligator shears and "Danielson's" line of power presses. It will increase the capacity of its plant by installing new machinery, including a horizontal motor driven boring mill of 36-inch traverse, vertical travel of saddle 5 feet, and the column to have a travel of 8 feet with a spindle 4½ inches.

One of the most important of the new projects is that of the Best Foundry Company, which will erect a large foundry at Bedford, south of Cleveland, for the production of stove castings. The company has been in process of formation for some time and will organize and place contracts for buildings this week. Paul Schneider and D. Edward Dangler, prominently identified with the American Stove Company, are on a committee to place contracts for buildings and equipment. The statement is made, however, that the American Stove Company is not interested in the project. Kaltenbach & Griess of Cleveland, who have a large plant at Bedford, have plans for the plant. The main foundry building will be 180 x 400 feet; finishing department, 50 x 275 feet, and the pattern storage building, 40 x 40 feet. Other buildings will probably be erected, including a power house and machine shop.

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cutter, engine lathes, pipe machine, bending machines, electric whip hoists. Schedule 107—six 16-inch screw cutting lathes, three 18-inch screw cutting lathes, four 20-inch screw cutting lathes, two 24-inch by 16-foot screw cutting lathes, two 30-inch by 20-foot screw cutting engine lathes, one 30 x 60 inch gap engine lathe with 15-foot bed, one 16-inch by 6-foot tool room lathe.

The Bureau of Supplies and Accounts will receive bids until April 11 for the entire equipment for a new foundry at the League Island Navy Yard, consisting of a cupola, blowers, core ovens, car pit for crucible furnaces, cranes, crane ladle, &c.

The Bureau of Supplies and Accounts of the Navy Department March 14 opened bids for tools, &c., for the navy yards, as follows:

Bidder 1, Atlantic Works, Incorporated, Twenty-eighth street and Gray's ferry road, Philadelphia, Pa.; 3, American Hoist & Derrick Company, 63 South Robert street, St. Paul, Minn.; 8, Bentel & Margedant Company, 116 North Fourth street, Hamilton, Ohio; 14, Compressed Air Machinery Company 24 First street, San Francisco, Cal.; 17, Drew Machinery Agency, Manchester, N. H.; 23, Eby Machinery Company, 17 Main street, San Francisco, Cal.; 24, J. A. Fay & Egan Company, George place, agent, 120 Broadway, New York City; 27, Richard W. Geldart, 2 Stone street, New York City; 30, A. D. Granger Company, 95 Liberty street, New York City; 34, Henshaw, Bulkley & Co., 48 Fremont street, San Francisco, Cal.; 36, Hallidie-Henshaw-Buckley Company, Seattle, Wash.; 39, Handlan-Buck Mfg. Company, 210 North Third street, St. Louis, Mo.; 41, Interstate Engineering Company, Williamson Building, Cleveland, Ohio; 44, Lambert Hoisting Engine Company, 115 Pioneer street, Newark, N. J.; 48, C. W. Marwedel, 58 First street, San Francisco, Cal.; 50, Manning, Maxwell & Moore, 85 Liberty street, New York City; 52, Montgomery & Co., 105 Fulton street, New York City; 54, Muncipal Engineering & Contracting Company, 60 Railway Exchange Building, Chicago, Ill.; 58, Niles-Bement-Pond Company, 136 Liberty street, New York City; 59, New Jersey Foundry & Machine Company, 9 Murray street, New York City; 61, Oliver Machinery Company, Grand Rapids, Mich.; 62, Pacific Hardware & Steel Company, 401 Mission street, San Francisco, Cal.; 65, Pacific Tool & Supply Company, 101 First street, San Francisco, Cal.; 66, Prentiss Tool & Supply Company, 115 Liberty street, New York city; 70, Rockwell Engineering Company, 26 Cortlandt street, New York City; 73, Snare & Triest Company, 39 Cortlandt street, New York City; 81, Tatum & Bowen, 34 Fremont street, San Francisco, Cal.; 84, Vermilye & Power, 17 Battery place, New York City; 86, J. D. Westbrook, 265 Water street, Norfolk, Va.

Schedule 79.

Class 10. One brazier's forge complete; no bids.

Class 11. One automatic knife cutting grinding machine—Bidder 34, $155; 81, $116.

Schedule 81.

Class 14. One 850-pound improved guide hammer—Bidder 14, $1055; 34, $1040; 39, $1150; 58, $984; 62, $968; 81, $999.

Schedule 82.

Class 20. Sixty-six miscellaneous cutters—Bidder 36, $153.02 and $137.90; 39, $128.38; 48, $144.52; 52, $128.40; 65, $128.05; 81, $129.42.

Class 21. Sixty-six patent involute cutters—Bidder 36, $453.11; 39, $461.01; 48, $529.64; 52, $456.01; 65, $456.45; 81, $456.64.

Class 24. One motor driven automatic tapping and drilling machine—Bidder 86, $520.

Class 25. Two surface planing machines, motor driven—Bidder 23, $1030; 34, $1160 and $1220; 81, $1233.40.

Schedule 83b.

Class 1. One concrete mixer—Bidder 27, $2039; 39, $1800 and $2200; 54, $1672.

Class 2. Four double cylinder double drum hoisting engines, 2 guy derricks, 1 stiff leg derrick with engine and boiler, 2 pile drivers, 8 derrick skips, 12 contractors' dollies, 2 steel grab hooks and chain, 2 timber and stone tongs, sling chains, lashing rings and shackles, galvanized shackles and thimbles, 150 Crosby clips, 6 lever jacks and 1 orange peel bucket—Bidder 3, informal, bid on part of class; 27, $20,939.50; 30, $13,750.42; 41, informal, bid on part of class; 44, $18,356.10 and $18,656.10; 59, $21,167.55; 73, informal, bid on part of class; 84, $13,817.98.

Schedule 84.

Class 3. One power feed rod machine—Bidder 8, $225; 17, $284.80 and $186; 24, $259; 58, $1475.

Class 4. One wood lathe—Bidder 8, $120; 17, $94.50 and $86.85; 24, $219; 58, $110; 61, $128.

Class 5. One reciprocating power mortiser—Bidder 1, $179.50; 8, $200; 17, $193; 24, $397.

Class 6. One heavy rip saw table—Bidder 24, $710; 61, $660.

Class 7. One motor drive outfit for No. 2½ E. C. & B. pipe threading and cutting machine—Bidder 58, $450.

Schedule 85.

Class 8. One screw cutting extension gap lathe—Bidder 50, $699; 58, $437 and $855; 66, $546.

Schedule 86.

Class 9. Annapolis—one rotary melting furnace outfit complete with all fittings—Bidder 39, $1200; 70, $1955.

The following bids were opened February 28 in the office of the Isthmian Canal Commission for furnishing a quantity of rock drills:

Item 1, 25 pneumatic rock drills; 2, three sets blacksmith tools for making bits; 3, three sets blacksmith tools for making shanks; 4, 25 extra steam heads for drills; 5 (alternate), 25 pneumatic rock drills, size 25 F.

The following are unit prices:

McKiernan Drill Company, New York, item 1, $227.50; 2, $7; 3, $1.40; 4, $6; 5, $237.50.

Sullivan Mfg. Company, New York, item 1, $269.54; 2, $8; 3, $1.20; 4, $11.08; 5, $231.15.

Wood Drill Works, Paterson, N. J., item 1, $219.76; 2, $7.14; 3, $3.14; 4, $7.58; 5, $256.42.

Compressed Air Mfg. Company, San Francisco, Cal., item 1, $329; 2, $9.16; 3, $2.05; 4, $9.14; 5, $354.37.

Ingersoll-Sergeant Drill Company, New York, item 1, $263.64; 2, $7; 3, $2; 4, $8.25; 5, $319.56.

Rix Pressed Air Drill Company, San Francisco, Cal., item 1, $300; 2, $7; 3, $7; 4, $8; 5, $325.

John M. Rodgers, Gloucester City, N. J., item 1, $389.65; 2, $9.50; 3, $3; 4, $9.50; 5, $421.05.

Chicago Pneumatic Tool Company, Chicago, Ill., item 1, $250.45; 2, $7; 3, 90 cents; 4, $6.30; 5, $275.45.

Rand Drill Company, New York, item 1, $265.40; 2, $7; 3, $2; 4, $8; 5, $318.58.

Jeffrey Mfg. Company, Columbus, Ohio, item 1, $150; 2, $5.25; 3, $1.25; 4, $4.50; 5, $165.

Bids were opened by Major G. S. Bingham, depot quartermaster, New York, February 23, for furnishing one lathe and one double punching and shearing machine as follows:

L. E. Le Blond Machine & Tool Company, Cincinnati, Ohio, one Le Blond lathe, $1655.

Manning, Maxwell & Moore, New York, one Putnam lathe, $1042 and $1548; one Hilles & Jones punching and shearing machine, $1250.

Niles-Bement-Pond Company, New York, one lathe, $1425; punching and shearing machine, $1535.

The property of the Townsend-Downey Shipbuilding Company at Shooter's Island, Mariner's Harbor, Staten Island, was sold at public auction March 14 by Henry P. Ide, trustee in bankruptcy. The ground and buildings brought $455,000 and the stock and fixtures $51,000. All was purchased by the Colonial Trust Company of New York, trustees for the bondholders.

A double throw crankshaft, stated to be the largest ever forged, was handled last week under a 14,000-ton hydraulic press at the Bethlehem Steel Company's Works, Bethlehem, Pa. The steel ingot from which it was made weighed 240,000 pounds, and the finished shaft will be 27 feet long, the largest diameter 37 inches and the smallest 30 inches. This shaft is one of three that will be used in three 5300 horse-power gas engines that are being erected at San Francisco for the California Gas & Electric Corporation.

The Minnesota House of Representatives adopted unanimously a resolution appointing a committee of seven who should confer with the State Board of Control and the warden of the State Prison as to the feasibility and desirability of erecting and operating a State plant for the manufacture of harvesting machinery. The resolution states specifically that the cause for this step is the consolidation of practically all existing plants into one company.

Fire broke out in the plant of the Grand Crossing Tack Company, Seventy-ninth street and South Chicago avenue, Chicago, Tuesday morning, March 14, but was checked before it had gone very far. The principal damage done was to sections 15 and 16 of the plant, containing the printing, fence wire and polishing departments. Further information is not now available from the officials of the company. Local reports have it that the damage to portion of building and contents destroyed is about $200,000.

Official denial is made of the report published in Pittsburgh daily papers that the Carnegie Steel Company will build four more blast furnaces and an open-hearth steel plant at Duquesne, Pa.

HARDWARE.

IT is eminently proper that there should be cordial relations between the jobbing and the retail trade. Many of the retail merchants of the country naturally buy a large proportion of their goods from the jobbers because they are in a position to supply them more economically and advantageously than the goods could be procured directly from the manufacturers. It is proper, too, that between the National Hardware Association, made up of many of the leading jobbers—though not including the largest houses—and the retail associations of the various States there should be a good understanding and amicable relations. Complimentary resolutions passed by one class of trade in commendation of the other are among the harmless and possibly beneficial amenities of organization activity. It is, however, carrying courtesy a little too far when one of the largest and most influential of the State associations adopts the following preamble and resolution:

> *Whereas*, We desire to make special mention of the great aid rendered our association, as well as the retail trade of the country, by the National Hardware Association of the United States, who for years have been pursuing a policy which has been in the interest of our branch of the trade,
>
> *Resolved*, That we express a hope that the time is not far distant when the few houses not now members of the National Hardware Association will become members of that most excellent association, and thus through the united efforts of the manufacturers, jobbers and retailers our chosen business will be more pleasant and profitable.

If these words are to be taken seriously as expressing the mature sense of the convention, which it is not at all likely that they do, there is little doubt that broad minded merchants, wholesale and retail, and manufacturers generally will be disposed to take exception to this remarkable utterance in view of the facts in the case.

The National Hardware Association is an admirable example of an organization of jobbing interests for the promotion of its own advantage. In seeking this end some of its measures may be advantageous and others disadvantageous to the retailers, but the question which determines the association policy is quite properly the advantage or disadvantage of the jobbers who are members of the association. This it would frankly acknowledge, and refrain from making a plea that it is working for the interests of either the manufacturers or the retailers except as its own will be served or advanced. This is, indeed, eminently suitable. An association of jobbers looks after the interests of the jobbers; an association of manufacturers after the interests of the manufacturers, and an association of retailers after the interests of the retailers. If an association of any of these classes should work for the interests of the other classes to the detriment of it own it would be recreant to its trust and disloyal to those whom it claims to represent.

It is, too, a matter of fact, when the records of jobbers' associations are considered, that they find it necessary or at least they deem it on the whole advisable to do some things which are certainly hardly in the retailers' interests. In this connection it will be borne in mind that the jobbing trade as a whole, whether in the National Hardware Association or independent of it, have until very recently sold catalogue houses, and opinions differ as to whether or not this trade has been entirely discontinued. Though the association as a whole would certainly prefer to have its members carry out the policy which they have adopted of refusing to sell those houses, there is no means of controlling the membership in this regard. There is no doubt, too, that the jobbing trade in their associated capacity recognize the undesirability of having the retail merchants purchase directly from the manufacturers, and they have used their influence persistently to make it difficult, if not impossible, for this direct dealing to be carried on even by the larger class of retail merchants. Manufacturers are sometimes persuaded that they should refuse to sell any except jobbing houses, and many of the more enterprising retail houses, some of whom are buying very considerable quantities of goods, quite sufficient for factory shipments, have found it hard to get their orders accepted and executed by certain manufacturers who are in close touch with the organized jobbers. Again, while it is equitable that there should be a difference in price on large as compared with small orders, it is unquestionably detrimental to the interests of the smaller merchants to have manufacturers establish a very wide differential between the price quoted to the retail trade and that at which the wholesale houses buy. Efforts by some wholesale associations, too, are made to prevent the members from cutting prices or making prices which are too low to yield an adequate profit. Such an attempt, while justified on many considerations, is not easy to carry into effect, but in so far as it is successful the result is that the retail merchants have to pay higher prices from the jobbers uniting in such efforts than they would have to pay houses who are not influenced by association recommendation or suggestion in this direction. This is not in any sense a criticism of the association jobbers, for in working along these lines they would be entirely justified if in this way their interests would be effectively served.

The resolution quoted above is, however, even more remarkable than the preamble. It starts out with the mistaken assumption that there are only a few jobbing houses outside the National Hardware Association. The fact that several of the largest Hardware jobbing houses are outside the association is obviously in the mind of the individual who framed the resolution. It would, however, be a great mistake to regard these houses and the members of the National Hardware Association as the only jobbers in the country. To say nothing of the Southern Hardware Jobbers' Association, a number of the members of which are not members of the national body, and several minor organizations of the jobbing trade, there are in almost every State other jobbing houses of excellent standing. They do not indeed attempt to cover the entire country, but they are doing a wholesale business, and are recognized as jobbers, as, for example, when they are given place among the jobbers in the classified lists of manufacturers or associations of manufacturers who thus subdivide and classify the trade. These houses, some of whom do principally a local jobbing business, are regarded, too, as among the most desirable customers for a manufacturer to have. To overlook them in speaking of the jobbing trade of the country is an obvious blunder. They are an important and a growing class and sure to be heard from more and more. The "few houses not now members of the National Hardware Association" are certainly numbered by hundreds.

The resolution, however, looks away from the benefits which the associated jobbers are now conferring on the trade to the happier days which lie somewhere in the near future, when all the jobbers of the country are

brought into the one and only association of wholesale Hardware interests. The uniting of all jobbers in one organization and the acceptance by all of the same principles and guidance are regarded as an auspicious consummation which awakens no apprehension. The association will be so wise and beneficent in its working that the few remaining evils in the trade will presumably diminish and disappear. Were it not for this brilliant prospect the suggestion of the retail Hardware merchants that the outside jobbers, large and small, ought to cast in their lot with the National Association, might, indeed, appear to border on impertinence, or at least be criticised as going beyond the usual province of association work. If all the jobbers, too, were in one camp, it might occur to some that there is just a possibility that there would be certain disadvantages which are not now experienced, when the associated and the independent houses are in the keenest kind of competition not only for the retailer's business, but also for his good will and his favorable opinion. If, in the presence of the genial spirit manifested in the resolution, any one would have the hardihood to look at the matter calmly and judicially, he might reach the conclusion that, all things taken together, there is not much difference in the treatment of the retail trade by the two classes of jobbers whom the resolution would like to see amalgamated into one great organization; that the retailers have little ground for complaint in regard to either of them; that the dignified and honorable houses found within and without the association are entitled to the confidence and the good opinion of the thousands of retail distributers; that, on the whole, it is probably better for the manufacturers and for the retail merchants, and possibly for the jobbers also, to have things as they are rather than have the outside jobbers act upon the hint that they ought, and without delay, to become loyal members of the association which has received such unqualified indorsement. This suggestion is certainly an interesting, if not amusing, culmination of a remarkable deliverance.

Condition of Trade.

With the advance of the season, even though exceptionally backward, there are indications of a decided increase in the general activity of trade. With a good many wholesale merchants and manufacturers January and February were somewhat disappointing, but reports show that with the opening of March there was, in many sections at least, a perceptible quickening of the pulse of trade, and advices come to us of a very gratifying increase in the volume of business, especially with the jobbers. Meanwhile there is in the country at large a generous movement in commercial circles, as indicated, for example, in the clearing house statistics, which show a remarkable increase beyond last year. The prosperous condition of the railroads and the liberality with which they are covering their requirements; the stimulus which trade is feeling and the large crops of the past season; the strength of the Iron market, which is still advancing, and the general prosperity of the people are among the influences which are apparently working together to make the present year a notable one in a business way. There does not seem to be any recession from the hopeful tone which has prevailed for some time, and the trade are looking forward to a large business during the season. In the Hardware field there is little new in the matter of prices to note. The market is decidedly firm in tone and advances in minor lines are frequent, while heavy goods, which feel the effect of the strength in Iron, have a strong tone. With the confident feeling which exists the disposition to purchase freely on the part of merchants and to produce freely on the part of manufacturers is apparently justified.

Chicago.

The books of the leading jobbing houses indicate that the month of February fell a little behind the corresponding month last year, due no doubt to the extremely cold and stormy weather of the first three weeks of the month, and to the fact that the very heavy buying that characterized the months of December and January left the dealers well stocked. When warm weather opened in the last week in February business picked up remarkably, and up to the present time it has been coming in in great volume, so much so that there is a general feeling that March of this year may even exceed the phenomenal business in the same month of 1904. Prices are stationary, but some lines, notably Wire products, seem to be slated for an advance. Just about this time a year ago Wire Nails were advanced from $1.90 to $1.95, Pittsburgh, to jobbers, and Wire Rods were advanced from $30 to $31. To-day Wire Rods are sold in Pittsburgh at about $35, and Nails are still down to the basis of $1.80. In other words, while Wire Rods are $4 a ton higher than they were two years ago, Nails and other Wire products made from these Rods are $2 a ton lower. The most active commodity in evidence to-day is Poultry Netting, and it seems as if all the dealers in the country want their Netting all at once. Dealers who ordered for April delivery as well as those who did not order at all are rushing into the market for immediate shipment. Fortunately the mills and the jobbers are well able to withstand a rush of this kind, as they have accumulated stocks. Demand for Woven Wire Fencing is also excellent, the same conditions applying as to the Poultry Netting. It is evident that the trade expects higher prices on both these lines. The warm weather throughout the West for the last three weeks has stimulated the movement of Wire Cloth. Steel Goods are in active demand, and carpenters', masons' and contractors' Tools scarcely less so. From all over the country comes a healthy demand for Builders' Hardware, the medium priced goods reflecting the greatest activity. Spring trade in Ranges and Cook Stoves is characterized by an unusually large volume of orders and an unusually small percentage of specifications on orders, it being evident that dealers are protecting themselves against possible advances by having orders entered, and that the current consumptive demand has not developed to a great extent.

Louisville.

BELKNAP HARDWARE & MFG. COMPANY.—The month of February as a "sales proposition" was a distinct disappointment in this part of the country. Whether the falling off in comparison was due to weather conditions is a question; whether the Southern country has entered upon an era of economy incident to low priced cotton is another. Certain it is that the South has enjoyed unprecedented prosperity for the last two years. Not only has agriculture been handsomely rewarded, but industrial progress has surprised even its best friends, and this seems likely to continue.

The more seasonable weather which has now come on has served to float the logs out of the Kentucky streams. There has been a better stage of water the last few days than for two years previous. This is a great relief to the lumber and logging interests, and the river packets are steaming over their long vacated routes.

There is every evidence of a free business—viz., easy money, wide credits and active employment for all willing to accept it, but even with all these there come times when people quit buying, just as the ground seems bound to lie fallow once in so often. We can stand just about so much of the strenuous and no more. But to correct the idea of unusual ease come the market reports from *The Iron Age*, which indicate extreme strength and activity, and we must take our cue accordingly.

New features in the conduct of business have cropped up which are being watched with a great deal of interest,

some apparently looking toward concentration, some toward wide expansion. The State meetings of the Hardware associations are about over, and a good deal of valuable matter has been threshed out in these. There is naturally much interest felt in a formula which was propounded and expounded at the several meetings—namely, that 75 per cent. of energy in the mercantile houses should be expended on the selling, leaving the rest to be divided out among the other departments—buying, shipping, billing, administration of various kinds. Just how this is arrived at mathematically it would be difficult to say, but anything repeated often becomes impressive. Possibly the author of this formula would be willing to develop it further for the benefit of the trade at large and those who did not have an opportunity to hear him.

Baltimore.

CARLIN & FULTON.—The bad weather, which has been the general theme for discussion for so many weeks, has continued to within the past two or three days, and it is needless to say has interfered most decidedly with trade in every direction. Now that the sun has shown and the temperature risen somewhat we look forward to a great improvement in business conditions very soon. As the trade generally since the first of January have been confining their purchases to their absolute necessities, which have been very small, stocks must necessarily be greatly depleted, and the possibilities are that business will be much more active in months that have heretofore usually been dull.

The manufacturing interests throughout the country seem to have great faith in the future activity of trade, inasmuch as there are in so many instances notices of advances in prices with no reductions to record. The immense purchases authorized by the railroad companies throughout the country and the projected improvements of a municipal nature, calling for the expenditure of vast sums of money everywhere, will give a sure foundation for the stability of prices, especially in certain lines of material, and the demand for manufactured goods which is bound to follow the inactivity of the last two months will no doubt stimulate manufacturing interests to a wonderful degree.

The delays in transportation still continue to be very great, which delays are only equaled by the length of time necessary to collect for losses in transportation. We can see no reason why a railroad company, having lost a portion of a shipment, should require a year to settle for same, when probably a month is long enough to demonstrate the fact of the loss sustained by the shipper. It is these vexatious delays which cause frequently so much antagonism to railroad management and which could be so easily prevented by greater attention and more prompt consideration of claims when presented.

San Francisco.

PACIFIC HARDWARE & STEEL COMPANY.—To-day marks the opening of the annual convention of the California State Retail Hardware Dealers' Association, at the St. Francis Hotel, in this city. This convention has brought together a large number of retail dealers in Hardware from all portions of the State, and proves the growing interest among this class of merchants in association work. The retailers of this State have been able to do much good for themselves through their association, not only by creating friendly feeling among themselves, but more particularly through united efforts in seeking the aid of the local jobbers and securing their co-operation in planning and putting into effect many trade reforms. The Executive Committees of the various retail Hardware associations and subassociations have come to learn that the jobbers in their own immediate home territories can do them much good and have striven to point out to their membership the increased influence that the associations will have by working in close harmony with the local jobbers.

It is therefore not surprising that the business of our jobbing houses is constantly increasing, until to-day we have some of the largest houses in our line in this country who are carrying unusually large stocks. It is a recognized policy of the retail Hardware associations that in patronizing the home jobbers they are building up their own community and making in their own territory a power which can always be used to influence any good that can be accomplished through trade associations. The interest taken in the present convention shows the appreciation of the results obtained by association work in the past, and we express the hope at this time that in working in closer harmony we may be able to accomplish the best results for all interested and for the good of our community.

Nashville.

GRAY & DUDLEY HARDWARE COMPANY.—Since January 1 our reports have not been very optimistic in tone. The great decline in the price of cotton which occurred in December, followed by unprecedented bad weather in January and February, diminished the volume of the Hardware business in this locality very much for this period. The bad weather, which was so unusual in this section of country, prevented a great many improvements which would have been started in these months; farm work is therefore from four to six weeks behind at the present time. We will hardly be able to recover in March and April all of the business which we lost in January and February for the above mentioned causes, but March is certainly not a disappointment to any one in the Hardware business. The demand for goods is so strong that it seems not to be a question of how much goods a house can sell, but of how much goods it can ship. The jobber who has foresight enough to supply himself well with goods during the bad weather, anticipating the great rush, is now reaping a harvest.

We have beautiful weather. Our people seem to have made up their minds to pocket the losses which they sustained by the decline in the price of cotton, have taken a new lease on commercial life, and started out to retrieve their losses, instead of sorrowing as those who have no hope.

We have steadily maintained that when our people understand the situation they will realize that our country is in better fix than it has ever been before, notwithstanding the low price of our leading farm product. Prices are pretty well maintained. It is not altogether a question of who will sell the cheapest, but a more important matter is who will ship promptly. Collections are improving.

St. Paul.

FARWELL, OZMUN, KIRK & CO.—Business has improved considerably since the latter part of February, and it is now moving along at about the pace that it usually takes at this season. February was rather a dull month. General and special conditions were both to some extent adverse. But there was nothing of permanency in these conditions, and they have now for the most part passed away, and business, both as to volume and character, is about normal. The weather has been generally mild, the snow has mainly gone and we have entered the period known as "the spring break up." It is not desirable to see much mild weather inside the next four weeks, as disaster to early vegetation would otherwise be invited. In our latitude March is not a month of sunshine and spring showers, but rather of frost and chilly blasts.

It is better too for trade to conform as much as possible to this condition, and yet it has its fluctuations. A week of warm, sunshiny days changes the current of business greatly and sends it forward with a bound. Then a spell of zero weather comes along and its grip is apparent in the order register. With all its ups and downs March is usually a good month for Hardware with the wholesale trade, and the present month promises to keep up the record.

Retail dealers are not afraid of the market, and will buy for wants. The orders will not be large and for the most part will be free from speculative buying.

Portland, Oregon.

CORBETT, FAILING & ROBERTSON.—Monday made a new record for a single day's clearing, so that for the week

Portland should make a good showing in per cent. of increase. Clearings were swelled by the sale of the Columbia River & Northern Railroad and Boat Lines to Eastern parties, which released some $800,000 of local capital that will be available for further development of local business and industries. The railroad was built in the State of Washington solely by Portland capital, which has in the past done much to help develop that rapidly growing State. A local bank is building a standard gauge railroad now across Washington from Tacoma to the Columbia River, developing vast tracts of timber and coal lands heretofore unavailable.

Colonists' rates now in effect are bringing in trains of two and three sections, one day landing 800 immigrants in Portland. These new comers with investments and work will tend to increase present and future business.

The last week in February showed temperature of 70 degrees and the first week in March 65 to 70. Although we are as far north as Montreal no section of the United States beats us in climate. We will demonstrate this fact to those visiting the Lewis & Clark Exposition if we have a normal summer. Trade still holds up well for the season and should increase from now on.

Cleveland.

THE W. BINGHAM COMPANY.—We have nothing special to report at this time, but feel very much encouraged on account of the orders we are receiving daily through our salesmen and by mail. The breaking up of cold weather and the disappearance of ice and snow are doing much to increase trade. In the main, throughout the country our men do not find stocks very large, and we are led to believe from the well assorted orders we are now receiving from our customers that we are going to have a very large spring trade. Spring goods of all kinds are going forward, viz., Wire Cloth, Poultry Netting, Steel Goods, Shovels, Spades, Scoops, &c. In anticipation of the advance that the manufacturers reported some time ago they were going to make on Builders' Hardware, trade has been stimulated considerably, and we are selling a large amount of this class of goods.

Every indication points to a very good business in the spring, and we are filling up our stocks liberally with the idea of being able to serve our customers promptly. We advise our customers to look over their stocks and buy promptly and liberally, and not wait until they have calls for the goods and then expect the jobber to supply them promptly at the last moment. Anticipate wants as far ahead as possible on all lines is our advice to the trade.

Omaha.

LEE-GLASS-ANDREESEN HARDWARE COMPANY.—During the past two weeks the business situation has remained in practically the same condition as outlined in our former review. At this season of the year pleasant and stormy days follow each other closely, which will probably represent the weather conditions during the remainder of this month at least.

The agricultural communities are taking prompt advantage of every favorable opportunity to make preparations for the necessary field work. A copious supply of moisture throughout the corn belt has placed the soil in admirable condition for the reception of seed grain, so that general conditions as they exist at the present time could not be materially improved.

The satisfactory volume of business now being transacted warrants the conclusion that a very heavy trade will develop just as soon as the weather settles, and permits outdoor work of all kinds to proceed uninterruptedly.

Philadelphia.

SUPPLEE HARDWARE COMPANY.—The recent improvement in weather conditions has brought with it a corresponding improvement in business in trade circles, and there is now every indication of the starting up of outside or outdoor work which has until recently been prevented owing to the unfavorable weather. It is now becoming possible for country customers to reach their various towns or cities in order to carry their products and also make purchases. Factories generally report favorable conditions of trade and we feel the pendulum is now swinging in the proper direction. The quiet and calm of enforced conditions in the past six weeks of trade, owing to unfavorable weather, is likely to score a change to active trade. Prices remain firm and collections fair.

NOTES ON PRICES.

Wire Nails.—New business is not at the present time being received in large volume by the mills, but specifications on contracts are fairly satisfactory. The scarcity of steel and high prices for same are impressing the trade with the possibility of an advance in the price of Nails and Wire. The prospect for a large demand when Spring trade opens up is excellent. Delays in the prompt receipt of mill shipments are still annoying the trade. No announcement of change in price has been made up to the hour of going to press, and current quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Carloads to jobbers	$1.80
Carloads to retailers	1.85

New York.—The local demand depends largely upon the weather, pleasant days showing an increase over unpleasant ones. As a rule, however, merchants are beginning to buy more liberally for stock. New York quotations are as follows: Single carloads, $1.99; small lots from store, $2.05.

Chicago, by Telegraph.—No change has been made in the price of Wire or Nails. March 10 a year ago a $1 advance was made, and it was expected by some that something of the kind would be done this year, particularly as the price of Wire Rods was advanced $2 a ton when Bars were advanced March 1. Wire Rods are now selling at about $35, Pittsburgh, with Nails at $1.80, Pittsburgh, to jobbers, while a year ago Wire Rods were quoted at $31, Pittsburgh, with Nails at $1.90, a manifest discrepancy. Quotations are as follows: $1.95, base, in car lots to jobbers; $2 to retailers, with 5 cents extra for less than car lots from mill.

Pittsburgh.—Current demand for Wire Nails is light, but the mills still have many contracts on their books, on which buyers are specifying at a fairly satisfactory rate. In view of the high prices and scarcity of Steel, the trade is inclined to believe that an advance in Wire Nails is probable. A much heavier demand is expected as soon as Spring trade opens up and with the return of favorable weather, permitting outside building operations. Prices are firm and we quote: Wire Nails in carloads to jobbers at $1.80; carload lots to retailers, $1.85, and in less than carloads at $1.90, f. o. b. Pittsburgh, terms 60 days, or 2 per cent. off for cash in 10 days.

Cut Nails.—Bad weather has restricted the use of Cut Nails for some months, and demand continues light. Specifications on contract orders are also in small volume. Prospects for future business are brighter. Quotations are as follows: Carload lots, $1.80; less than carload lots to jobbers, $1.85, and to retailers, $1.95, f. o. b. Pittsburgh. Iron Cut Nails, for delivery at Pittsburgh, Buffalo and all points west of these cities, 10 cents advance per keg on Cut Steel Nails.

New York.—With weather more suitable for out of doors operations a slight improvement in demand is noted. New York quotations are as follows: Carloads on dock, $1.94; less than carloads on dock, $1.99; small lots from store, $2 to $2.05.

Chicago, by Telegraph.—Cut Nails are officially offered at the same base price as Wire Nails, the following being the Chicago quotations: $1.95 for car lots to jobbers for Steel Nails; $2 in car lots to retailers; 5 cents extra for less than car lots, and from 5 to 10 cents extra for Puddled Iron.

Pittsburgh.—There is only a fair demand for Cut Nails, but the mills have a good many contracts on their books on which buyers are specifying only fairly, inclement weather having very much restricted consumption of Nails in the past several months. We quote as follows: Carload lots, $1.75 to $1.80; less than carload lots to jobbers, $1.85, and to retailers, $1.95, f.o.b. Pittsburgh. Iron Cut Nails for delivery at Pittsburgh,

Buffalo and all points west of these cities, 10 cents per keg advance over Steel Cut Nails. The above price of $1.75 on Steel Cut Nails is minimum of the market and is obtainable only by the large trade and for desirable orders.

Barb Wire.—The Western section of the country is enjoying a satisfactory demand, while in the Eastern portion requirements are light. The market is firm in tone. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Chicago, by Telegraph.—Continued warm weather has greatly augmented the demand for Barb Wire, and very heavy shipments are being made from mills to jobbers and from jobbers to retailers. Quotations are as follows: Car lots to jobbers, Painted Wire, $2.10; Galvanized, $2.40; car lots to retailers, 5 cents higher; less than car lots, Painted Wire, $2.25; Galvanized, $2.55; Staples, Bright, $2.05; Galvanized, $2.35.

Pittsburgh.—A fairly active demand for Barb Wire prevails in the West, but in other sections of the country is quite light. A material increase in new tonnage is expected just as soon as spring trade starts and favorable weather comes. We quote as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

	Painted.	Galv.
Jobbers, carload lots	$1.95	$2.25
Retailers, carload lots	2.00	2.30
Retailers, less than carload lots	2.10	2.40

Smooth Fence Wire.—Manufacturers of Wire Fencing in the West are ordering liberally, while demand from general sources is light. Quotations are as follows, f.o.b. Pittsburgh, 60 days, or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

The above prices are for base numbers, 6 to 9. The other numbers of Plain and Galvanized Wire take the usual advances, as follows:

	6 to 9	10	11	12&12½	13	14	15	16
Annealed	Base	$0.05	.10	.15	.25	.35	.45	.55
Galvanized	$0.30	.35	.40	.45	.55	.65	1.05	1.15

Chicago, by Telegraph.—Information is given that the demand for Wire from the makers of various patent brands of Wire Fencing is exceptionally large and that the mills have all that they can do to supply their customers' requirements. Quotations are as follows: $1.80, base, for Annealed Wire, in car lots to jobbers; $1.85 in car lots to retailers, with 5 cents advance for less than car lots, and 30 cents premium over Annealed for Galvanized.

Pittsburgh.—New demand is light, but the mills are fairly busy on contracts. With the return of favorable weather a material increase in demand is confidently expected. We quote as follows, f.o.b. Pittsburgh, 60 days or 2 per cent. discount for cash in 10 days:

Jobbers, carloads	$1.65
Retailers, carloads	1.70

Binder Twine.—Reports indicate that demand is light, and that independent concerns are soliciting orders. The International Harvester Company is not offering Twine, and no announcement has been made as to when selling will be resumed. The market is fairly represented by quotations ¼ cent in advance of those announced at the beginning of the season, as follows:

	Per lb.
Sisal	9¾c.
Standard	9¾c.
Standard Manila (550 feet)	10¾c.
Manila (600 feet)	12c.
Pure Manila (650 feet)	13¼c.

Five-ton lots, ⅛ cent less; carload lots, ¼ cent less, Chicago delivery, usual terms of payment. Kansas City, Omaha, Council Bluffs and Minneapolis, ¼ cent added. Prices not guaranteed. Allowing for freight, New York prices would be ¼ cent lower than the above.

Extras on Rivets.—For some years there has been no agreement among the Rivet manufacturers as to prices, or even as to what were to be regarded as base sizes. The result of this has been much irregularity in prices, and in base sizes as well, and at times Rivets were being sold below actual cost of making them. To correct this unsatisfactory condition a meeting of the principal Rivet manufacturers was held in the Hotel Lincoln, Pittsburgh, on Tuesday, March 7. F. Bourne of Bourne & Knowles, Cleveland, was chairman, and W. F. Mackenzie of the Upson Nut Company, also of Cleveland, was secretary. After a full discussion of conditions existing in the Rivet trade it was decided to establish a base price for Round Head Structural Rivets and a price 10 cents per 100 pounds higher for Cone Head Boiler Rivets. Extras over the above prices were adopted as follows:

Cone Head Boiler Rivets.

¾ to 1¼ inch diameter, inclusive.....Base price.

Button Head Structural Rivets.

¾ to 1¼ inch diameter, inclusive.....Base price.

Extras.

½ and 9-16 inch diameter.....25 cents per 100 pounds.
⅝ and 11-16 inch diameter.....15 cents per 100 pounds.
Lengths shorter than 1 inch.....50 cents per 100 pounds.
Countersunk heads in quantities less than 1,000 pounds of one diameter.....25 cents per 100 pounds.
Flat Head Rivets.....25 cents per 100 pounds.
Rivets packed in 100-pound kegs.....10 cents per 100 pounds.

Special heads and diameters other than above enumerated and Rivets made cold to be charged for extra at the discretion of the maker.

We are advised that the prices determined upon, which may be regarded as conservative in view of the higher prices of raw material, are being steadily observed. It is probable that meetings of the Rivet manufacturers will be held from time to time to discuss trade matters, but no definite date was set for the next meeting.

Barn Door Rail and Hangers.—Some of the manufacturers of Barn Door Rail and Barn Door Hangers are announcing advanced prices on account of the increased cost of the raw material.

Rope.—As the season advances trade shows quickening impulses by an improvement in demand. This is regarded as an indication of a still larger increase in the future. The market continues without change in prices. Quotations are as follows: Pure Manila, 11¾ to 12 cents; Pure Sisal, 10 cents; No. 2 quality Sisal, 8 to 8¼ cents per pound.

Window Glass.—The output of factories has exceeded demand for the past six weeks, during the cessation of building operations owing to the extreme cold weather. Prices have also settled a little as a result of these conditions. The demand is likely to show improvement from this time forward, and should labor troubles not seriously interfere with the amount of building already projected it is estimated that consumption will equal the output to May 30, the time when it is supposed the majority of the factories will close for the summer months. Local quotations are as follows: First two brackets, single, 90 to 90 and 15 per cent. discount; larger sizes, both single and double strength, 90 to 90 and 10 per cent. discount.

Oil.—*Linseed Oil.*—The market shows less strength than it did immediately after the recent advance, especially on State and Western Oil. Crushers are willing to accept contracts for longer periods, some up to June. The easier feeling may be in part attributed to higher price obtainable for Seed Cake. Should this decline a further advance in Oil would be probable. Demand from local dealers is light, owing to climatic conditions. Large buyers, it is thought, have about covered their requirements to June 1 by placing contract orders. New York quotations are as follows: City Raw, 47 to 48 cents per gallon, according to quantity; State and Western Raw, 45 cents, in any quantity.

Spirits Turpentine.—The market has moved up ½ cent during the week, on favorable reports from Southern points. The syndicate at Savannah is credited with controlling the largest part of the Turpentine stock, or about 16,000 barrels, besides buying all that is offered daily. Owing to unfavorable weather the new crop, which is generally due about April 1, may be two or three weeks late, and reports indicate that the new crop

will be smaller than the 1904 crop. New York quotations are as follows, according to quantity: Oil barrels, 54½ to 55 cents; machine made barrels, 55 to 55½ cents per gallon.

Carriage Bolts, Machine Bolts, &c.—At a meeting of the manufacturers of Carriage Bolts, Machine Bolts, &c., held March 15, an advance of 2½ per cent. was made along the whole line. The new discounts are as follows, there being the usual extra discounts to large purchasers:

Common Carriage Bolts, ⅜ x 6 and smaller and shorter, rolled thread	75 and 5 %
Common Carriage Bolts, ⅜ x 6 and smaller and shorter, cut thread	75 %
Common Carriage Bolts, longer and larger than ⅜ x 6,	65 and 10 and 7½ %
Machine Bolts, ⅜ x 4 or shorter and smaller	75 and 2½ %
Machine Bolts with H. P. or C. P. plain nuts	70 and 2½ %
Machine Bolts with C. and T. nuts	65 and 7½ %
Bolts without nuts, 6-inch and shorter	10 per cent. additional.
Bolts without nuts, longer than 6 inches	5 per cent. additional.
Machine Bolt blanks	70 and 2½ %
Bolt ends, with H. P. or C. P. plain nuts	70 and 2½ %
Bolt ends with C. and T. nuts	65 and 7½ %
Gimlet Point Coach Screws	75 and 12½ %
Cone Point Lag Screws	75 and 17½ %
Skein Screws	75 and 12½ %

Nuts.—The manufacturers of Cold Punched and Hot Pressed Nuts, at a meeting held March 14, advanced Cold Punched and Hot Pressed Nuts 1-10 cent, and in addition made 1-10 cent differential on Hot Pressed Tapped Nuts. The new prices are as follows, beyond which are the usual concessions for large buyers:

	Cents off.
Cold Punched Plain Blank Square Nuts	4.80
Cold Punched Plain Blank Hexagon Nuts	5.30
C. T. and R. Blank Square Nuts	5.00
C. T. and R. Blank Hexagon Nuts	5.70
Cold Punched Plain Tapped Square Nuts	4.80
Cold Punched Plain Tapped Hexagon Nuts	5.30
C. T. and R. Tapped Square Nuts	5.00
C. T. and R. Tapped Hexagon Nuts	5.70
Hot Pressed Square Blank Nuts	5.30
Hot Pressed Square Tapped Nuts	5.20
Hot Pressed Hexagon Blank Nuts	5.70
Hot Pressed Hexagon Tapped Nuts	5.60

National Retail Hardware Dealers' Association.

(By Telegraph.)

THE city of Minneapolis welcomed the sixth annual convention of the National Retail Hardware Dealers' Association with sunny skies and hearty hospitality. The sessions were held at the West Hotel and delegates were in attendance from 18 States from Connecticut to Colorado and from Kentucky to North Dakota. Under the rule that each State Association was entitled to two delegates for the first 100 members or less, with an extra delegate for each 100 members additional, about 70 accredited delegates were seated. This number was augmented by a large number of enthusiastic Hardwaremen from Minnesota and other States who came on their own responsibility.

The programme called for a meeting on Tuesday morning, but in its stead the members were piloted by H. O. Roberts, a Minneapolis member, to the Chamber of Commerce, the tower of the Guarantee Building and through Donaldson's great department store. This latter institution created especial interest when it was explained that its management was in hearty accord with the Minneapolis Hardware Dealers' Association in maintaining prices, being a member of the association in good standing.

President's Address.

The opening session of the convention in the afternoon was devoted largely to routine work. W. P. Bogardus of Mt. Vernon, Ohio, president of the association, delivered his annual address. It was an earnest, thoughtful, conservative *résumé* of the situation broadly viewed. The horizon of the retail dealer, he said, had extended greatly since the formation of State and National associations, and it was realized that much of the work that was being done now would bear fruit in the next generation more than in this, there were

CLOUDS ON THE HORIZON,

one of which was, of course, the competition of retail catalogue houses, but the blackest cloud at the present time was the persistent effort that was being made to prostitute the postal department of our Government to be a merchandise carrier for a few great corporations to the disadvantage of the many retail dealers. The great railroad systems of the country, he said, were yielding to the temptation to grant special favors to some that were denied to others, throttling legitimate competition and building up dangerous monopolies. Looking beyond the narrow horizon over our own stores the duty of citizenship compelled every merchant to fight for equity and fair dealing on the part of all common carriers, for the abolition of secret rebates, for the ownership by the roads of all their cars, for Government charters and Government inspection for all such public servants, and for a prompt delivery of merchandise intrusted to them.

That one State should be permitted to grant a char-

W. P. BOGARDUS.

ter to any corporation which should give that corporation the privilege of transacting business in all the States without responsibility to any one he pronounced a wrong that could only be righted when corporations doing interstate business should be compelled to look to the general Government for their franchises and be subject to the inspection of the general Government.

He commended the Joint Wholesale and Retail Committee for the valuable work it had done, and gave a *résumé* of the labors and accomplishments of that committee. By the agitation of the catalogue house question particularly and by correspondence and interviews with jobbers and manufacturers the president said that the retail dealer had at last secured recognition of the fact that he was the distributer, that manufacturers and wholesalers of Hardware owed it to the retail dealer that he should be protected and that all retailers should be treated alike.

WORK FOR THE FUTURE.

The immediate duty before the dealers was that of perfecting their associations and bringing into membership the sleeping ones by awakening them to a sense of their danger. Of equal importance was the organization of local associations and the inculcation of the idea that retailers were in business for a living and not for the purpose of killing each other. Said he: "The new conditions that confront us are pregnant with results for good if we are wise; we have the confidence and help of the jobbers. We have the sympathy and support of the manufacturers. They are represented at this convention by a committee who are here to confer with us. We must show them how thoroughly we appreciate the conditions and how ready we are to do the things that are necessary for our mutual benefit."

In closing, Mr. Bogardus paid an earnest tribute to the zeal and intelligent and untiring efforts of Secretary Corey.

Secretary's Report.

M. L. Corey, Argos, Ind., the national secretary, read his annual report, in which he reviewed the work accomplished by the National Association somewhat in detail. He also described the splendid growth and valuable work of the State associations, and urged every member to exert his utmost efforts to increase the membership.

Committees.

The following committees were appointed:

FINANCE: A. T. Stebbins, Rochester, Minn.; O. E. Lang, Mishawaka, Ind.; F. C. Moys, Boulder, Col.; C. S. Johnson, Barberton, Ohio; Clark Bloss, Dunkirk, N. Y.

RESOLUTIONS: F. B. McKenney, Rockford, Ill.; H. L. McNamara, Janesville, Wis.; H. S. Vincent, Fort Dodge, Iowa; James De F. Phelps, Windsor Locks, Conn.; C. H. Casey, Jordan, Minn.

INSURANCE: Chas. F. Ladner, St. Cloud, Minn.; S. L. Fenner, Terre Haute, Ind.; L. Lindenberg, Dubuque, Iowa.

GRIEVANCE: J. F. Doty, West Liberty, Iowa; J. Frank Barr, Lincoln, Neb.; G. W. Wolbert, Bismarck, N. D.; M. S. Mathews, Minneapolis, Minn.

LEGISLATION: A. R. Sale, Mason City, Iowa; E. H. Ramm, New London, Wis.; J. F. McGuire, St. Paul, Minn.; F. Neudorff, St. Joseph, Mo.

CONSTITUTION AND BY-LAWS: H. J. Hall, Lincoln, Neb.; C. N. Barnes, Grand Forks, N. D.; J. E. O'Brien, Crookston, Minn.; Geo. L. Moore, Brownsville, Pa.; L. Lindenberg, Dubuque, Iowa.

NOMINATIONS: A. N. Shidler, South Bend, Ind.; C. S. Johnson, Barberton, Ohio; J. R. Sower, Frankfort, Ky.; J. E. Digby, McKees Rocks, Pa.; C. N. Barnes, Grand Forks, N. D.

PLANS AND SUGGESTIONS: E. M. Bush, Evansville, Ind.; Charles H. Williams, Streator, Ill.; A. R. Sale, Mason City, Iowa; W. G. Johnston, Oklahoma City, Okla.; H. J. Hall, Lincoln, Neb.; S. R. Miles, Mason City, Iowa; A. H. Abbe, New Britain, Conn.; A. N. Shidler, South Bend, Ind.; Frank A. Bare, Mansfield, Ohio.

TO CONFER WITH JOBBERS: Leon C. Warner, Minneapolis, Minn.; J. R. Sower, Frankfort, Ky.; L. D. Nish, Elgin, Ill.; C. E. Haas, Le Mars, Iowa; T. W. Stevens, Oneonta, N. Y.

TO CONFER WITH MANUFACTURERS: S. R. Miles, Mason City, Iowa; Geo. W. Rockwell, Horseheads, N. Y.; A. J. Scott, Marine City, Mich.; W. L. Hubbard, Scottsburg, Ind.; Frank A. Bare, Mansfield, Ohio.

PLACE OF MEETING: Ralph M. Burtis, Oshkosh, Wis.; H. F. Emery, Fargo, N. D.; Emil Tietgen, Manitowoc, Wis; Albert De Prez, Shelbyville, Ind.; Chas. P. Sherwood, White Plains, N. Y.

The members of the Executive Committee were designated to act as an Auditing Committee.

Entertainment.

In the evening the delegates and their friends, nearly 200 in all, were guests of the Commercial Club at dinner. Fred. W. Salisbury, president of the club, delivered an address of welcome, which was happily responded to by President Bogardus. The day's entertainment ended with a theater party at the Orpheum.

The entertainment of the delegates while in Minneapolis is in the hands of a joint Committee of Arrangements, consisting of the following members: For the association—W. H. Tomlinson, Le Sueur, Minn.; J. F. McGuire, St. Paul; M. S. Mathews. For the Minneapolis Retail Hardware Asociation—L. C. Warner, H. O. Roberts, C. F. Stremel, William K. Morison, Frank S. Lane, Jacob Stoft.

Wednesday Morning Session.

On Wednesday morning the committees appointed on Tuesday made reports and matters of general importance were discussed in executive session. W. M. Pratt of the Goodell-Pratt Company, Greenfield, Mass., and C. W. Asbury of the Enterprise Mfg. Company, Philadelphia, as a committee from the American Hardware Manufacturers' Association, addressed the meeting and assured the retailers that the manufacturers were with them in any and all moves that would correct present abuses and wrongs in the distribution of Hardware products.

THE firm of Oldham & Ranahan and the William H. Clarke Estate, Southbridge, Mass., have combined their interests as the Oldham & Ranahan Company, which will carry on a general Hardware business together with the business of plumbing, steam fitting and metal work. The two stores will be remodeled and re-equipped generally. The company requests catalogues of fixtures for a modern office, with special attention to the filing of catalogues and price-lists.

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New York State Association of Retail Hardware Dealers.

CONCLUDING REPORT.

IN our last issue we recorded the auspicious opening of the Buffalo meeting of the New York State Association of Retail Hardware Dealers. The promise then given of a successful gathering was fully realized during the closing days of the convention, and the association enters upon its work with full confidence that its future operations will be characterized by growth and usefulness.

The Secretary's Report.

The report of Secretary J. B. Foley, which was presented on Thursday in executive session, showed that the association had made a material gain in membership, 52 new members being added up to March 1, with a further increase of 40 during the convention. The total membership is now 217. This indication of the growth of the association was received with much satisfaction, and appreciation was expressed of the efforts of the secretary and other members who had been active in securing this accession.

The Treasurer's Report.

A very satisfactory financial condition was reflected in the report rendered by F. E. Pelton, the treasurer of the association. After paying the obligations of the past year there was, March 1, a balance of about $200 in the treasury. This was further augmented by the receipt of over $500 paid during the convention.

Committees.

For the work of the association with special reference to the Buffalo meeting, the following committees were appointed by the president:

FINANCE AND AUDITING.

L. J. Ernst, chairman.....Rochester.
W. T. Olin.....Perry.
A. E. Towne.....Saratoga Springs.

TRANSPORTATION.

C. L. Sleininger, chairman.....Buffalo.
J. J. Douglass.....Binghamton.
Geo. V. Cameron.....Albany.

CONSTITUTION AND BY-LAWS.

W. D. Hollowell, chairman.....Penn Yan.
G. W. Rockwell.....Horseheads.
A. S. Matthews.....Fort Covington.

PRESS COMMITTEE.

J. B. Foley, chairman.....Syracuse.
J. Vrooman.....Schenectady.
W. E. Case.....Warsaw.

PROGRAMME.

C. P. Sherwood, chairman.....White Plains.
R. R. Williams.....New York.
Wm. Fowler.....White Plains.

QUESTION BOX.

L. G. Mattison, chairman.....Newark.
F. M. Young.....Gloversville.

NOMINATIONS.

W. T. Olin, chairman.....Perry.
C. W. Young.....Elmira.
H. M. Sponnenburg.....Watertown.
F. A. Weed.....Potsdam.
T. F. Wagonschultz.....North Tonawanda.

RESOLUTIONS.

Clark Bloss, chairman.....Dunkirk.
Wm. Gainey.....Auburn.
J. H. Voorhees.....Baldwinsville.
Jesse Sage.....Rochester.

CREDENTIALS.

J. B. Foley, chairman.....Syracuse.
Archie Stewart.....Fort Plain.
F. E. Williams.....Homer.

RECEPTION COMMITTEE.

Geo. B. Allen, chairman.....Buffalo.
H. J. Knapp.....North Tonawanda.
C. J. Elderfield.....Niagara Falls.

SPECIAL ON ORGANIZATION.

John R. Taylor, chairman.....Little Falls.
Mr. Stanford, Teller & Stanford.....Schenectady.
Francis Hanlon.....Medina.
H. B. Koenig.....North Tonawanda.
F. D. Smith.....Cortland.

Insurance.

The matter of retail Hardware fire insurance, which was presented in an interesting and forcible manner by W. P. Lewis, New Albany, Ind., was given careful consideration by the association. It was urged upon the members that the whole matter be carefully canvassed so as to have, if feasible, an insurance department in connection with association work, with a view not only to serving the interests of the members, but as an instrumentality through which an important increase in membership may be secured.

Letter from W. P. Bogardus.

The absence of W. P. Bogardus, president of the National Retail Hardware Dealers' Association, was greatly regretted, but he sent a letter in which he touched in his usual clear and forcible manner on trade questions, especially those connected with the work of Hardware associations. The reading of the letter by the secretary was listened to with the closest attention and marked evidences of approval.

The Success of the Association.

Much credit for the success of the association and of the Buffalo convention was accorded to President Ferres and the other officers associated with him in the direction of the work of the organization. Mr. Ferres' personality, his ability and businesslike methods contributed much to the pleasure and success of the meeting. He declined, however, to accept a re-election, deeming that on general principles it is desirable that the honors and responsibilities of office should be distributed among the members, and pledging his continued interest and support to the association under the administration of his successor, Charles P. Sherwood. The appreciation in which Secretary Foley and Treasurer Pelton are held was indicated by their unanimous re-election. Much credit was also given to the Reception Committee, under the efficient chairmanship of George B. Allen, with whom H. J. Knapp and C. J. Elderfield were associated. One of the most active officials was Charles P. Sherwood, chairman of the Programme Committee and now president of the association. In view of his interest, ability and position in the trade Mr. Sherwood's election was regarded with much satisfaction.

Delegates to the National Convention.

An interesting report was rendered by H. Jason Knapp of North Tonawanda, who was a delegate to the conven-

tion of the National Retail Hardware Dealers' Association which met in Indianapolis in March, 1904. Mr. Knapp spoke in an appreciative manner of the very cordial reception accorded to him and of the pleasure as well as the usefulness of the gathering. The following members were elected delegates to the national convention for 1905: George W. Rockwell, Horseheads; Mr. Stevens, Oneonta; Frank Miller, Olean, with Charles P. Sherwood, White Plains; William Fowler, White Plains, and Clark Bloss, Dunkirk, as alternates.

Hospitality.

The cordial and hospitable spirit evidenced in many ways by the manufacturers and merchants of Buffalo contributed much to the pleasure of the members and the success of the convention. Invitations prior to the meeting had been extended by a number of the Buffalo houses to visit their establishments and many of the members availed themselves of the opportunities thus presented. Prominent merchants and manufacturers were also unremitting in their attention to the delegates.

Officers for 1905.

In accordance with the report of the Nominating Committee the following officers were unanimously elected for the ensuing year:

President, C. P. Sherwood, White Plains.
First Vice-President, Louis J. Ernst, Rochester.
Second Vice-President, L. G. Mattison, Newark.
Treasurer, F. E. Pelton, Herkimer.
Secretary, J. R. Foley, Syracuse.
Directors for three years: John E. Larrabee, Amsterdam; William Stark, Saranac Lake; Thomas Hobbs, Utica. John G. Ferres was elected also to fill the unexpired term of L. G. Mattison, who was promoted to a vice-presidency, and George B. Allen was chosen to fill the unexpired term of C. E. Hills of Oneonta, who has retired from the Hardware business.

Next Meeting of the Association.

Binghamton was selected for the next place of meeting for the association. The date will be determined by the Executive Committee.

Resolutions of Thanks.

On the recommendation of the Committee on Resolutions the thanks of the association were tendered the retiring president, John G. Ferres, for his valuable services to the association and convention; to the manufacturers and jobbers of Buffalo for the delightful and royal manner in which the members were entertained; to the Iroquois Hotel for many courtesies; to the Local Committee for their painstaking and considerate attention and efforts, and to the speakers and others who contributed materially to the success of the gathering.

Unity of Forces.

One of the addresses which was received by the convention with marked favor was that of E. C. Neal of the Buffalo Wholesale Hardware Company, who spoke on "Unity of Forces." Besides referring to the recent development of trade organizations in every department of the Hardware field, Mr. Neal treated in a practical and suggestive way several matters of special interest to the association. The address, in part, was as follows:

The most prominent topics before the Hardware trade to-day are catalogue house competition and the parcels post agitation. There are also other subjects which it would be advantageous to discuss, such as benefits derived from discounting bills, extending long time credit, how shall we deal with various demands made upon us by our employees, how much do personal magnetism and courtesy to customers increase sales, is it possible to conduct a Hardware store on a cash basis, whether an annual inventory is necessary, how can we best bring neighboring Hardware dealers to a mutual understanding that will insure a living profit and create a better fellow feeling, &c., but of them all I have selected for consideration the subject, "Unity of Forces."

NEW CHANNELS.

We are living in a progressive age; times and conditions are changing. The trend of trade is being diverted to a greater or less degree into other channels than through the regular retail Hardware dealer. The idea that predominated yesterday is forgotten, and the thought of to-day is but the pass word for to-morrow. Profits are waning. The banker, lawyer, mechanic, housewife, farmer and doctor have all been tempted to try something novel, something new, and, as a result, the Hardwaremen of to-day find themselves confronted by many serious problems. They are perplexed. This is not only true of the retail dealer; it is equally true of the jobber and the manufacturer. But this is nothing new; it is the same old story in a new garb. I am not as old as some of you in the trade, but I well remember how trying it was a few years ago right here in our own city when we had a merchant who tried our souls most dreadfully. He was a retail dealer, pure and simple; plenty of capital, but purchased in quantities beyond his ability to sell easily in a regular way, unloading part of his goods at about cost. You know what that means. True, he did not send his quotations throughout the country, but canvassed the city of Buffalo pretty thoroughly. He is no longer in the trade.

This is but a sample of the beginning of what we have before us to-day—unprofitable competition. We were able to combat the situation in our city, and with

EDGAR C. NEAL.

the brains that the Hardware trade of the country possess we will be able to withstand successfully any competition of the future, of any nature or from any source.

THE VALUE OF ASSOCIATION.

But how? Ten years ago it became apparent that the Hardware jobbing interests of the country were in a very unsatisfactory condition. Appreciating this fact, a number of gentlemen met in the city of Cleveland in a conference, out of which grew the National Hardware Association. From its inception the aim of this association has been "a high standard of business methods." They have labored to the end of convincing the manufacturer that his province was the manufacturing of goods, the jobber's the distributing and the retailer's mission to supply the consumer. They have had, and still have, trials, tribulations and discouragements, but they stand to-day a tremendous power in the Hardware world.

A few days ago we received a letter from a party in the State of Pennsylvania, asking if we had sold a certain dealer a line of goods at certain prices, which prices I may say were considerably below the market and less than the present cost. The reason for the inquiry was that the customer had claimed that he had made the purchase from us. The customer evidently made an error (I will say he willfully misrepresented the facts), as we had no transaction with him. We did not know him. Our men do not go to his town. We so wrote the party making the inquiry.

Think you that our competitor would have done this some years ago? If you do you are mistaken. There is no agreement or understanding in the National Association that such things can or will be done, but it is some-

times a good idea to trace up some of those fellows, and you will observe our letter stamped the lie. Our competitor simply felt free to write us; we were glad to give him correct information. Suppose that the customer's word had been accepted. You know demoralization on that line of goods would have followed.

NEVER WAS THERE GREATER NEED FOR ASSOCIATED EFFORT than to-day. Not only should you feel the inspiration, but you should appreciate the necessity. If the evils from which you are suffering are to be cured, it must be done through united, determined co-operation each with the other. Pardon me for the statement, but I must say many of the retail dealers are their own greatest enemies and that nothing stands so much in the way of their success as themselves. I was talking a few days ago with a gentleman in our store, a member of your association, and whom I consider one of the most successful retail merchants in the State. We were talking about trade in general, and he said that trade was fairly good, but that profits were much smaller than they used to be. I said, That's true and it is unfortunate, for there is no business that requires so much ability to handle as the Hardware business yet brings such small returns. But, I asked, why is it? He said to me, Because we have two stores in our town that sell nearly everything without a profit. In his town there are five or six stores. All of the men in that town are not members of this association.

MERCENARY SPIRIT.

Do you know that it takes a man of broad mind to get out of a rut and change his point of view? It is always the fellow who has the narrow mind that makes the trouble. One of our greatest difficulties to-day is that the mercenary spirit to a large degree predominates. There is no way of doing without money. It is essential to our business, comfort and happiness, but the desire for it does not give us the right to lie or steal, neither does it give you or me the right to sell goods below cost to make our competitor squeal, or try and close him out of an honest and honorable business. He has a right belonging to him, given him by his Creator, and when we try to crush him out we trifle with his God. As much of the trade in your community as you can get legitimately, profitably and honorably belongs to you, the balance to your competitor, and *vice versa*.

If you cannot sell your wares at as high a price as your neighbor, quality for quality, there is something wrong with you. If he cannot do the same there is something that needs mending there. No matter what either of you do, you cannot get all the business. It is no crime to be unwilling to sell goods at a loss or without profit. But, you say, tell us how this can all be brought about? By unity of forces.

CONSENSUS.

Let me call your attention to the largest institutions that we have to-day, known as catalogue houses and department stores. They have a large force of shrewd business men. These men are in charge of departments, each one having a larger stock or greater volume of business than most retail merchants here to-day. There would be, for example, the following departments: Tools, Stoves, Crockery, Hardware, Sporting Goods, Groceries, Boots and Shoes, &c., each one a store in itself. The men of these stores, if you please, are called together for consultation very frequently, and discuss plans and devise ways of handling their business. Why do they do it? Because the management want their ideas, the consensus of opinion, and will govern their methods accordingly. This is nothing more or less than your association will do. It is a very essential feature in the trade to-day. The difference is simply this: You are obliged to leave your homes for a few days, intrusting your business to partner or trusted head clerk. You do this once a year, and during the intervening time you are struggling alone, working out your own salvation. These others are at one central point every day, and can be summoned at a second's notice.

Do you think that you can in this twentieth century do without comparing notes with your neighbor, when concerns whose business runs into the millions need conferences? Go to your competitor and say to him that you can see where you are both wrong. Show him where you are both doing a lot of business for glory. Get on friendly terms with him, and when a customer tells you that he can buy Nails at $2.10, base, when they cost $2.15, base, at the mill, or Conductor Pipe at 3 cents per foot when it costs 3½ cents per foot, or a steel Shovel at 50 cents when you sell it for 75 cents, 'phone the merchant or go over and ask him if this is true. If he is a member of your association he will tell you what is true, and perhaps you can fix it up and thus avoid foolish competition.

HONEST COMPETITION.

Competition is commercial war. Unrestricted competition carried to its logical conclusion means death to some of the combatants and injury for all. Even the victor does not soon recover from the wounds of the conflict. There must always be competition. To stamp it out, were such a thing possible, would mean stagnation and death. It would mean that there was to be no further progress. If there were no prizes to be obtained men would cease to put forth the effort which makes for progress and growth. If there were no larger prizes ahead of a young man than a mere office boy or drayman the likelihood is that few would put forth the effort to advance; but because there are prizes to be gained by competition men are willing to become practically slaves to their business or profession, and in gaining those prizes for themselves they make large contributions to the sum of human progress and happiness. We need competition if we would grow, but it ought to be honest and intelligent competition, and that is not what is being had under conditions which prevail in many lines of trade at the present time. Have a system in your business, buy the best goods, know what they cost, put your prices on them intelligently, sell them at a fair profit.

Gentlemen of this convention, your call has come. The battle for recognition and your rights is on. To win the fight you must stand as one man. Your president has given his command, forward march! Your officers are your servants. You must instruct them as to your wishes, hold up their hands, act through them on all matters that are of general interest, and if you will thus mass behind them, I venture the assertion that in another three years your association will be stronger than it is to-day and on your banner will be read in bold letters, "Victory," through unity of forces.

Address of C. F. Woeppel.

On Wednesday afternoon an interesting address was made by C. F. Woeppel, who is in charge of the wholesale department of Weed & Co., Buffalo, and from it we take pleasure in making the following extracts:

While perusing the programme of this convention I observed on the last page the synopsis of the work or purposes which you have outlined for yourselves and to which this session is devoted. The one paragraph of this synopsis to which I will allude reads as follows: "To confine trade to its proper channels and to reform abuses that now exist in business life." This matter is one of such vital importance to every merchant, be he retailer or jobber, that it will no doubt be ably discussed in your executive sessions.

I believe that every fair minded individual, be he farmer, mechanic, clerk or professional man, will admit that the store keeper or merchant who invests his capital in renting and stocking up a place of business, who does not act as agent for another, but who, after having purchased the merchandise, either by the display of his goods or by literature or by his personal efforts invites prospective customers to enter his establishment, this storekeeper or merchant is one of the legitimate channels. It is he who by his presence in the community helps advance the value of land, and by his very existence he invites the traveling salesmen to visit the village, or town, or city. He is therefore not only the creator but also, in a sense, the sustainer of the hotels and of other kindred enterprises to be found in any community.

I am of the impression that the public at large, especially in farming communities and smaller towns, and even in larger cities, need educating on such topics as self preservation. It is a pity that they do not see their

own interests, that they cannot realize that the interest and prosperity of the merchant is in a measure theirs. That the accommodation in a financial way and the many courtesies extended to them by their local merchants outweigh the imaginary saving of a paltry sum.

INTERESTING MERCHANTS IN OTHER LINES.

Your committee, in co-operating with that of the National Hardware Jobbers, has accomplished much good. A Herculean task, as it seemed at first, it has been so ably handled that it already bears fruit. Let the good work go on. Let vigilance be the password, and more and still greater good will result. But you should not stop here. Can you not employ other factors to assist you in combating this catalogue house evil? Why not interest your brother merchant? Cannot the grocer, the dry goods merchant, the furniture man, the druggist, take up the same work and fight the same battle which you are so nobly fighting? If they have no State Association they can form one. It only requires a leader.

Each and every Hardwareman should constitute himself a committee and make propaganda against this unfair competition. For the sake of argument, if the Hardwareman should succeed in compelling the catalogue houses to revise all their prices, I venture to say that the work would be only half done, for just so long as this catalogue, on account of lower prices on commodities other than Hardware and kindred goods, finds favor in the home of your customers, you will find this book to be a "drummer," and a share of the trade to which you are entitled will go to the catalogue houses to help pay the freight.

I therefore suggest the forming of committees whose sphere it should be to enlist the interest of the merchants in other lines to form themselves into societies for the purpose of inducing their jobbers and manufacturers to follow your example.

DON'T OVERLOOK THE LOCAL JOBBER.

Another important channel of trade, a factor in commerce, is the jobber, your local jobber. We will call him the auxiliary to the retailer, for if ever there were two factors in trade whose interests are identical they are the retailer and jobber. Their interests overlap. They are dependent upon one another. The jobbers are the sentinels who guard the interests of the retailers. The jobber stands ready to extend to his customer every possible courtesy and such accommodations as he may need. He sends his ablest men to represent him. He is deeply interested in your success and welfare. He does not ask you to buy large quantities of an article to get his lowest price. You need not buy a case of tacks to get the extra 10. He hands out to his regular customers his lowest prices. You receive your goods promptly and your jobber is always ready and willing to adjust any grievances you may have. He takes your word for any shortage, for he has entire confidence in you. But sometimes the retailer does not respond to this kindly feeling which the local jobber entertains for him. He prefers to buy his goods away from home. He seems to follow the example of the other fellow, who sends to the catalogue houses for his requirements. He seems to lose sight of the fact that the local jobber is dependent upon the locality in which he does business for his support.

Address by W. P. Lewis.

The programme called for an address on "Mutual Fire Insurance" by C. H. Miller, president of the National Hardware Mutual Fire Insurance Company, but he was prevented from attending by illness. In his stead W. P. Lewis, prominently identified with association work in Indiana as well as with the National Retail Hardware Dealers' Association, gave the following able and interesting address:

A few years ago a call was issued by several retail Hardware dealers in southern Indiana for a meeting to be held in Evansville. I attended this meeting and have in mind to-day a vivid picture of the secretary, who, in much wrath and agitation, recited the fact that in his town a fellow citizen was building a house. He asked our secretary for a price on Trimming Hardware. This was given, based on a very modest profit and with the full expectation of receiving the order. Subsequently our secretary saw in the freight depot this bill of Trimming Hardware shipped to his fellow townsman by a great jobbing house, of whom the secretary was a regular and constant patron. This incident was probably the culminating circumstance which brought into being the Southern Indiana Hardware Association. Later it became the Indiana Association, which, to-day, with some 20 or more well organized and aggressive State associations, comprise and support the great and growing National Retail Hardware Association.

THE RETAILERS' DIFFICULTIES.

The untoward conditions which cloud the horizon of the retail Hardware merchants are with us, yet these may be divided into two classes. First, those evils (universally recognized as such) which now exist, and, second, those forces now at work which seek to place even more intolerable burdens and restrictions on the retailer. In class one we find two principal evils: the disposition of both jobber and manufacturer to ignore the retailer and deal direct with the consumer, and the growing power of catalogue houses, which seem at times to buy at lower prices than the jobber and which market these goods direct to the consumer at a price ruinous to a retail Hardware merchant. In class two I refer to the stubborn and persistent effort made by the catalogue houses to foist on the Government the Parcels Post bill. In these two classes are found the fundamental evils that threaten the retailer of to-day.

JOBBERS AND MANUFACTURERS SELLING CONSUMERS.

Don't permit honeyed words by both jobber and manufacturer to obscure your vision, but keep blazoned on the walls of your commercial memories the legend that manufacturers should not sell consumers, that jobbers should not sell consumers except as provided in the National Retail Hardware constitution, that catalogue houses if sold at all should not have prices admitting of ruin to the retailer, and, last, that under no circumstance should the parcels post ever be permitted to become a law. If these sentiments had full and complete lodgment in the heart of every member of the many State associations and also found adequate expression they would, and they surely will, dominate the distribution of Hardware.

I have heard jobbers before these conventions prate to the retailer that he should dust his stock, sweep his store, smile on his trade, and not expect to make large profits or to get rich other than in a penny wise fashion. I have heard them strive to create the impression in the mind of the bewildered and sorely tried retailer that the reason he did not get along faster was because he did not dust and sweep and smile and save pennies enough. Away with such twaddle! This is but a blind to cover the action of jobbers who constantly trench on retail territory, competing with their own customers and naming prices to consumers which, if the retailer meets, make it impossible, no matter how much dusting and sweeping and smiling he may expend, to make any money.

ECONOMY OF DISTRIBUTION.

It is clear that there is a right relation between the manufacturer, jobber and retailer. It is demonstrable that the manufacturer can distribute his products with the least possible percentage of cost through the jobber. It is also demonstrable that the jobber can distribute his goods with the least possible percentage of cost through the retailer, and also that a jobber in right relation (and, fortunately, their number is growing) is the retailer's best friend. It is also clear that when a manufacturer markets direct to the consumer because of an extra 5 or 10 per cent. which he may extract from the consumer this extra 5 or 10 per cent. is no offset for the antagonism aroused in his jobbing client. When the jobber ignores the retailer for the same reason his trade loss is far greater than his trade gain, because the retailer is at once antagonistic and seeks all the devices of syndicate buying and direct accounts with the manufacturers, feeling that his jobber is his competitor and not his friend. When the manufacturer and the jobber both give way to the alluring offers of the catalogue house buyer when he offers them an order for a thousand dozen and they take it at a price 5, 7½ or 10 per cent. less than the price their salesmen would dare name to their retail trade, they at once undermine and seriously damage the very props on which the manufacturer and jobber have been supported for a century.

HARDWARE FIRE INSURANCE.

I now wish to bring to your attention that which is admitted to have been the most potential factor in bringing in membership—namely, mutual fire insurance. I wish to exploit specifically the National Mutual Fire Insurance Company of Huntingdon, Pa., and to show how large an influence it can be made if the members from every State will become its clients and carry a liberal line.

ITS SAFETY.

Mutual fire insurance confined to class risk is the safest form of mutual fire insurance. Mutual fire insurance confined to the class risk of retail Hardware is in our opinion the safest of all class risks. This we believe to be true for three reasons: First, because as a rule Hardware risks are well housed; second, because the moral risk of the average Hardware man is high; third, because the policy is limited.

THE NATIONAL MUTUAL FIRE INSURANCE COMPANY

has policies to-day in 20 States, but the limit of a policy is $3,000. Now, if all the members of the New York Association would send in an application to the secretary at Huntingdon, Pa., and all the members in all the other States would do the same thing, the National Company could, and it will as rapidly as possible, inaugurate the series system, which means, by way of illustration, that when $2,000,000 is written the first million will be separated and called Series A; when the third million is added to the second million another separation will occur, and the second million will be called Series B, and so on, the object of these series being that a policy holder could carry a policy to the limit in each series, thus increasing the amount. The National Company could carry each series operating independently, in that they carried their own losses. The growth of this company has been phenomenal, and this year of 1905 should yield its policy holders from 25 to 35 per cent. rebate. The National Company, under sufficient development, could comply with State laws and solicit directly.

A MEANS OF DEVELOPING MEMBERSHIP.

It could also furnish a solicitor who would develop State membership in weak and unorganized States. Its value as an insurance proposition New York and other States also do not seem to have wakened up to, and its value as a membership getter is great because no man can take a policy who is not a member of the State Association. New York has 27 policy holders, carrying $52,000 in the National Company. The number of the policy holders in the National Company from New York should only be limited by the membership of the New York Association.

Question Box.

The committee on the programme had made careful preparation for suggestions to be considered by the convention, and as a result of their efforts a large number of important and interesting questions were submitted to the convention. In reply to these questions the following opinions and practical suggestions were elicited:

In a discussion as to the best and most economical method of lighting stores there was something of a difference of opinion in regard to acetylene gas, some of the members referring to it as satisfactory, but others finding it expensive and troublesome. Electric light seemed to the majority to be the most satisfactory, all things considered.

The utility of cash registers was brought out, and most of the merchants who have them in use regarded them as desirable in preventing errors and the purloining of cash.

There was an interesting interchange of views in regard to the prominent displays of 5 and 10 cent goods. While some looked upon these with disfavor, the majority seemed to approve heartily of them.

There was considerable diversity in the estimated percentages of cost in doing business, which varied from 10 to 20 per cent. How much this difference resulted from the different methods of computing cost was not clearly brought out.

Several opinions from merchants of admirable business methods were in favor of cabinets for catalogues with sectional divisions for related goods, with card index for reference.

Souvenirs.

A number of souvenirs were distributed by the representatives of the manufacturers who were in attendance on the convention. Among these were the following:

E. C. ATKINS & Co., Indianapolis, Ind.: Pocket comb in the form of a Hand Saw.

PITTSBURGH STOVE & RANGE COMPANY, Pittsburgh: Pocket Pencils.

LISK MFG. COMPANY, Canandaigua, N. Y.: Miniature Dinner Pail.

PRATT & LAMBERT, Buffalo, N. Y.: Cigar lighter and spirit lamp in the form of a Varnish Kettle.

UNION METALLIC CARTRIDGE COMPANY, New York: Button badge and stick pin.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio: Stick pin and button.

PITTSBURGH STEEL COMPANY, Pittsburgh: Ornamental watch fob.

CONVENTION NOTES.

An enthusiastic spirit characterized the convention and great satisfaction was expressed at the tone of the meeting and the hopeful and enterprising spirit with which the merchants generally are regarding association work. A special committee of five was appointed by the president to suggest means of increasing the membership and report at the next annual meeting.

A letter was read from T. James Fernley, who sent for the perusal of the members a supply of reports of the Catalogue House Committee, and extended his greetings to the association, with the expression of the hope that the meeting would be eminently satisfactory.

The committee appointed recently by the president on revision of the constitution and by-laws reported that its work was well in hand and announced that its recommendations would be presented to the next annual meeting.

John R. Taylor read an address on Retail Hardware Dealers and Commercial Travelers, urging friendly relations between these classes. The views expressed met with the evident approval of the members.

Much regret was expressed in view of the fact that W. D. Hollowell, the recent president of the association, was detained at home by illness. On motion of Louis J. Ernst a dispatch of sympathy and greeting was sent by the convention.

A pleasant incident of the banquet on Tuesday evening was the presentation to the company of H. D. Hull of Troy, N. Y., the first president of the association. Mr. Hull was given a most enthusiastic greeting and spoke briefly in acknowledgment of the courtesy shown him and in regard to the general work of the association.

New Jersey Wire Cloth Company, Trenton, N. J., had a photograph of the convention taken under direction of its representative, T. McClelland, and copies of it will be sent as souvenirs of the occasion to the members of the association, with the compliments of the company.

In accordance with its enterprising and generous policy of bringing the Perfect Handle Screw Drivers to the attention of the retail trade, the H. D. Smith Company, Plantsville, Conn., furnished all the delegates to the convention with a set of the tools neatly boxed. The company is adopting this course in view of the difficulty experienced in introducing the goods through the jobbing trade.

MANUFACTURERS' EXHIBITS.

A significant feature of the convention was the number of manufacturers who had special representatives in attendance and in most cases made exhibits of their products. In this way an indication was furnished of their interest in the association, and the desire to establish and maintain the best relations with retail Hardware merchants. Representatives of the following manufacturing interests were in evidence at the meeting:

LANDERS, FRARY & CLARK, New Britain, Conn.

SHELBY SPRING HINGE COMPANY, Shelby, Ohio.

PETERS CARTRIDGE COMPANY, Cincinnati, Ohio.

ESTATE OF P. D. BECKWITH, Dowagiac, Mich., Stoves, Ranges and Furnaces.

YALE & TOWNE MFG. COMPANY, 9-13 Murray street, New York, Builders' Hardware.

ALLITH MFG. COMPANY, Chicago, Ill., Door Hangers, Store Ladders, &c.

WHITE LILY WASHER COMPANY, Toledo, Ohio, Washing Machines.

C. T. HOM MFG. COMPANY, Rochester, N. Y., Lamps and Lanterns.

BOSS WASHING MACHINE COMPANY, Cincinnati, Ohio.

LAWRENCE STOVE MFG. COMPANY, Buffalo, N. Y.

PRATT & LAMBERT, Buffalo, N. Y., Varnishes.
E. C. ATKINS & CO., Indianapolis, Ind., Saws.
VOSS BROS. MFG. COMPANY, Davenport, Iowa, Washing Machines.
SILL STOVE WORKS, Rochester, N. Y.
MCLENNAN PAINT COMPANY, Buffalo, N. Y.
DIAMOND SPIRAL MFG. COMPANY, Tinley Park, Ill., Washing Machines.
JEWETT & CO., Buffalo, N. Y., Stoves and Ranges.
NATIONAL ROOFING COMPANY, Tonawanda, N. Y., Asphalt Roofings.
UNION METALLIC CARTRIDGE COMPANY, 313 Broadway, New York.
PIKE MFG. COMPANY, Pike, N. H., Sharpening Stones.
L. & I. J. WHITE COMPANY, Buffalo, N. Y., Edge Tools.
PITTSBURGH STEEL COMPANY, Pittsburgh, N. Y., Steel Fence.
LISK MFG. COMPANY, Canandaigua, N. Y., Enameled Ware.
ENTERPRISE MFG. COMPANY OF PENNSYLVANIA, Philadelphia.
SARGENT & CO., New Haven, Conn.
DOVER MFG. COMPANY, Canal Dover, Ohio, Asbestos Sad Irons
NEW JERSEY WIRE CLOTH COMPANY, Trenton, N. J.
FOLLANSBEE BROS. COMPANY, Pittsburgh, Tin Plate.

REQUESTS FOR CATALOGUES, &c.

The trade are given an opportunity in this column to request from manufacturers price-lists, catalogues, quotations, &c., relating to general lines of goods.

REQUESTS *for catalogues, price-lists, quotations, &c., have been received from the following houses and are referred to the manufacturers:*

FROM C. SCHNEIDER, JR., 432 Orange street, Newark, N. J., successor to Jefferson Cort as dealer in Hardware, Paints, Oils, Varnishes, Brushes, &c. Mr. Schneider has made a number of changes in the establishment by which the conduct of the business has been much facilitated.

FROM C. E. DOE COMPANY, Baxter, Iowa, successor to F. C. Cool in the Hardware and Stove business. The new firm would especially like to receive printed matter relating to kitchen furnishings.

FROM SHOUPE & TINDALL, Fremont, Ohio, successors to E. M. Shoupe in the Hardware, Stove and Paint business.

FROM V. S. POWNALL, Coatesville, Pa., who is intending to build a new store, and would be pleased to receive printed matter relative to shelving, showcases, &c.

FROM THE TWENTIETH CENTURY HARDWARE COMPANY, P. J. Sullivan, proprietor, successor to Sullivan & Charest in the wholesale and retail business in Hardware, Stoves, Implements, Paints, Sporting Goods, &c., at Moorhead, Minn.

FROM W. E. CARTER & CO., Warrensburg, Mo., who have lately opened up in Hardware, Shelf and Heavy, Stoves, Implements, Paints, &c.

FROM KEARNEY HARDWARE COMPANY, C. W. Shahan, manager, Kearney, Neb., which has commenced the wholesale and retail business in Shelf and Heavy Hardware, Stoves, Paints, Sporting Goods, &c.

FROM J. M. DUECKER HARDWARE COMPANY, Kiel, Wis., which has been incorporated with a capital stock of $25,000 to prosecute the wholesale and retail business in Hardware, Stoves, Tinware, Implements, Sporting Goods, Paints, &c.

THE GELLER, WARD & HASNER HARDWARE COMPANY, now located at 419-425 North Third street, St. Louis, Mo., has leased the seven-story building at 412-414 North Fourth street, also the adjoining building 314 Vine street. The Fourth street building has a frontage of 52 feet by 133 feet deep; the Vine street building, which connects, has a frontage of 28 feet and a depth of 60 feet, making a total of over 70,000 square feet of floor space. The company is composed entirely of young men, and its growth is a tribute to the power of intelligent, energetic team work. The firm was incorporated in April, 1902, and started business in a four-story building. Its trade grew so rapidly that it became necessary to rent the adjoining building one and one-half years later for warehouse purposes. Since then the business has grown to such an extent that this latest removal to larger quarters was decided upon. The new quarters will be fitted up in the most up to date manner, so as to be able to handle goods economically as well as with the least delay. The first floor will be used exclusively as a sample and salesroom. The company expects to be located in its new quarters about May 1.

TRADE ITEMS.

UNION MFG. COMPANY, New Britain, Conn., has discontinued the manufacture of Cast Iron Butt Hinges, and is no longer in a position to fill orders for this class of goods. The company continues the manufacture of Lathe, Drill and Planer Chucks and Iron and Wood Planes.

THE NEW YORK CORDAGE COMPANY is moving into new offices at 80-86 Wall street, New York. R. D. Borden of Fall River, Mass., is now representing the company in New England, while J. J. Hundley of this city is traveling for the company in the States of New York and Pennsylvania.

THE HAMILTON EMERY & CORUNDUM COMPANY, Chester, Mass., is sending free to the trade who apply for it a case containing 24 samples of Turkish and Naxos emery. The case measures 4 x 12 inches and has a leather finish. It holds 24 vials containing samples of the different numbers of Emery which the company manufactures. Besides showing samples of its Emery it assists the dealer to become familiar with the different grades of Emery and their corresponding numbers. The company makes a specialty of Turkish and Naxos Emery of a superior quality.

THE VAN CAMP HARDWARE & IRON COMPANY, Indianapolis, Ind., has let contracts and broken ground for what will be one of the largest Hardware warehouses in the world. The building, which will have 9 acres of floor space, will front 200 feet in Maryland street and 200 feet in Mission street, facing the Big Four tracks. A switch long enough to accommodate six cars will run directly into the building. The warehouse will be eight stories high, slow burning mill construction, with concrete foundations and steel supports. It will be equipped with four freight and one passenger elevators. .

AMONG THE HARDWARE TRADE.

A. C. Boles recently succeeded J. L. Gossett in the Hardware, Stove and Tinware business, Casey, Ill.

Mann & Lemley have purchased the Hardware, Implement and Stove business formerly conducted by S. O. Carson in Washington, Iowa.

Lee & Miller have succeeded H. J. Lee in the wholesale and retail Shelf and Heavy Hardware, Stove, Tinware and Sporting Goods business at Fremont, Neb.

E. C. Petty has succeeded Petty & Snyder in the Hardware, Implement, Buggy and Harness business at Cowgill, Mo.

Sears & Winn have purchased the Hardware business formerly conducted by John Valentine in Fontanelle, Iowa.

Wilfred C. Howard has purchased W. M. Tichenor's interest in the Hardware business of Howard & Tichenor at Waupun, Wis., and will continue under his own name.

G. C. Winter, dealer in Hardware and Paints, Southbridge, Mass., tendered a banquet to his employees, 15 in number, on Washington's Birthday.

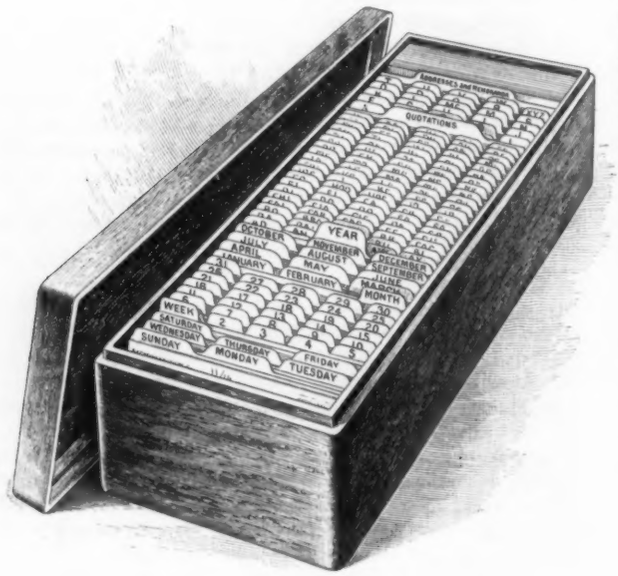
The Hardware firm of J. S. Malbone & Sons, South Haven, Mich., was dissolved on March 1. J. S. Malbone selling his share to A. D. Moore. The new firm will be known as the Malbone Hardware & Furniture Company.

The L. C. Arps Hardware Company has been organized at Tigerton, Wis., with a capital stock of $15,000. H. F. Leverenz, Clara Leverenz and L. C. Arps are the incorporators.

The Hardware Merchant's Card Index Record.

WITH a view to promoting the convenience of the enterprising and progressive Hardware merchant and enabling him to keep in close and systematic touch with details of his business which have much to do with its successful and money making conduct *The Iron Age* has devised and placed on the market the HARDWARE MERCHANT'S CARD INDEX RECORD.

The Card Index Record is contained in a finely polished and substantial oak box, about 14 inches long by 6 inches wide, a general view of which, with cover removed, is given herewith. The box is constructed of selected oak, with rounded corners, the richest grain effects being sought in the selection of the stock used, and is intended to find a place on the merchant's desk.



THE HARDWARE MERCHANT'S CARD INDEX RECORD.

The box is equipped with an adjustable follower block, which operates on an independent rod resting in a groove in the bottom of the box. This block is adjustable by slight pressure to any position desired. It is simple and efficient in its operation.

PURPOSES OF THE RECORD.

The Record is designed for three principal purposes:

1. For the systematic and convenient recording of buying and selling prices.
2. For special memoranda in regard to engagements, work to be done, &c.
3. To provide a place for addresses and general memoranda.

GENERAL DIVISIONS.

To meet these requirements it is divided into five general divisions, as follows:

WEEK.—For slips relating to matters which are to receive attention during the current week.

MONTH.—For slips relating to matters which call for attention during the current month, and not during the current week, the latter slips being given a place in the "Week" division.

YEAR.—Here provision is made for each of the 12 months; the slips for which are in due course transferred to the current "Month" and "Week" divisions as they come along.

QUOTATIONS.—In which slips containing quotations or prices are inserted.

ADDRESSES AND MEMORANDA.—For addresses and any information of a miscellaneous character not provided for in the other divisions.

ARRANGEMENT AND SCOPE.

To make the arrangement and scope of the Record clear to our readers we illustrate herewith separately the different divisions of which it is composed, and also some of the slips which are used in connection with the various divisions, filled out to indicate the manner in which they may be used by the merchant.

In the WEEK division, as noted above, slips are kept which have to do with matters which call for attention during the current week. These may come under the head of collecting money from parties who have promised to pay on a certain date; taking stock; obtaining quotations or ordering goods; reminders in regard to newspaper advertising; displays in the show window; calls on prospective customers; engagements, meetings, &c. Several of these and other uses are suggested, it will be seen, on the slips furnished, as shown herewith.

Get Quotations.
Order Goods.
Advertise Goods.
Display Goods
Put Away Goods.
Special Sales.
Changes in Store.
Collect.
Call on.
Prospective Business.
Engagements, etc.

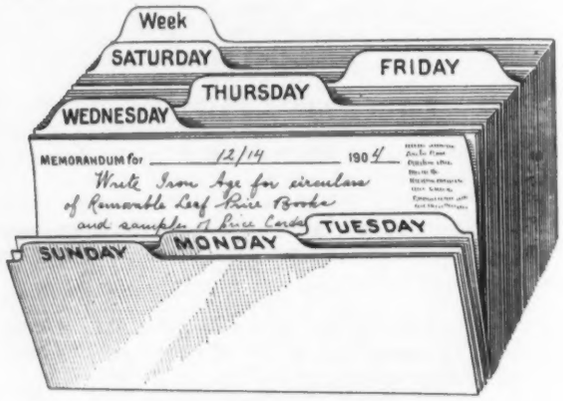


Fig. 1.—The Week Division.

In a similar way the MONTH division is employed to keep track of futures or things which do not require immediate attention, but of which the merchant should be reminded at the proper time. For this purpose the slips are placed according to the dates on which the matters should be attended to, and the slips are in due time transferred to the current "Week" division as a reminder to the merchant.

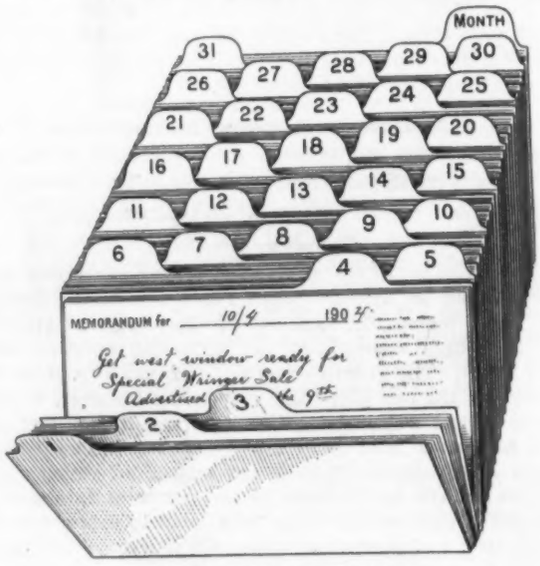


Fig. 2.—The Month Division.

The YEAR division is intended to accommodate slips relating to matters which belong to the more remote or distant future, such as the ordering of season goods, special sales or demonstrations, &c., the slips being

moved up to the "Month" and "Week" divisions as the time for action draws near.

The QUOTATIONS division is intended exclusively for

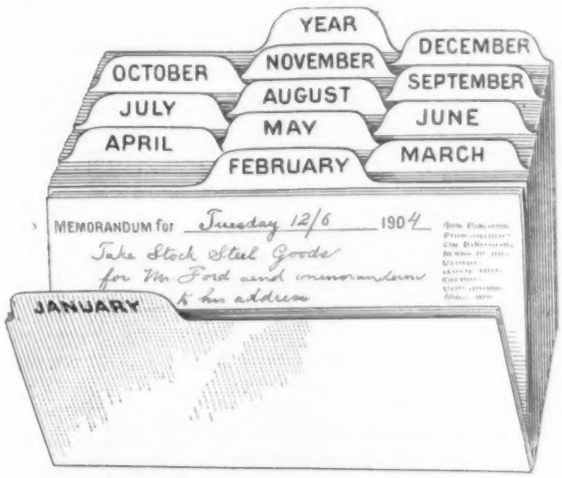


Fig. 3.—The Year Division.

slips recording prices or quotations. It is much the largest division and will be accounted by many as the most

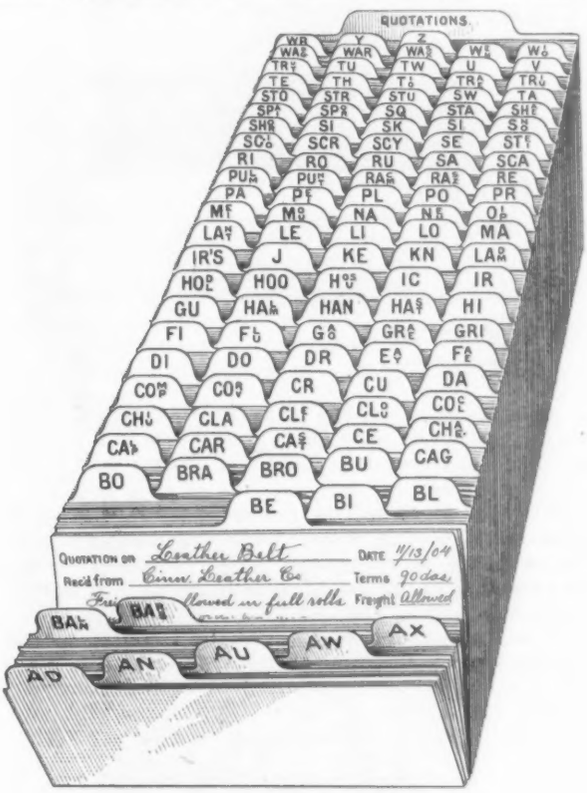


Fig. 4.—The Quotations Division.

important. With the alphabetical arrangement supplied provision is made for the easy and convenient accommo-

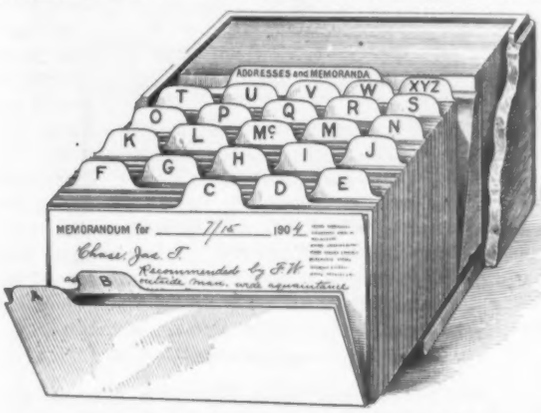


Fig. 5.—The Addresses and Memoranda Division.

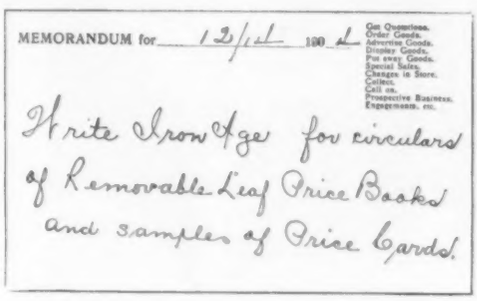
dation of price memoranda relating to every article in the merchant's stock. The multiple index, it will be observed, tells immediately just where each quotation slip belongs or may be found, there being only one place for it and that quickly discovered. The multiple index used is the same, with a few modifications, as that which appears in our Hardware Price Books, E, F and E2 (removable leaf).

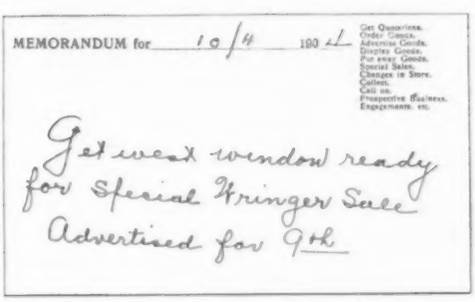
The ADDRESSES AND MEMORANDA division is alphabetically arranged, and in connection with addresses which it is desired to preserve may be used to take care of matters of a promiscuous character not covered by the other divisions.

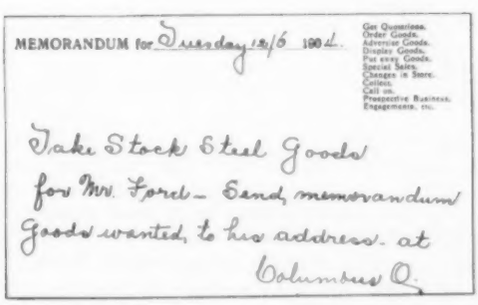
USING THE RECORD.

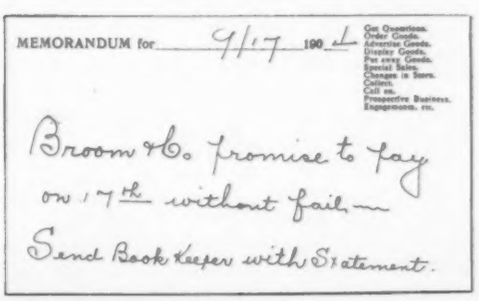
To illustrate a few of the many uses to which this Card Index Record may be put we reproduce a number of slips herewith filled out with entries such as might be made by a merchant. Several of the illustrations are of the general memorandum slips and others of the two forms of quotation slips.

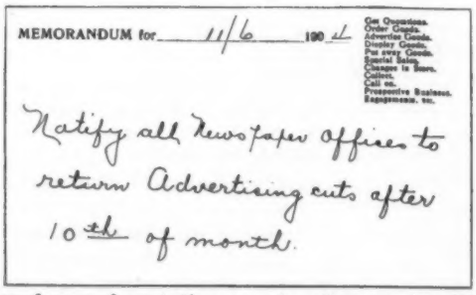
The memorandum slips, it will be readily understood, are filed in the "Week," "Month," "Year" and "Addresses and Memoranda" divisions, according to the character of the entries which they contain, and enable the merchant to plan his work ahead. For example, the first of the memorandum slips shown herewith would be filed in the "Week" division, as shown in Fig. 1; the second slip in the "Month" division, Fig. 2; the third slip in the "Year" division, Fig. 3, &c.






MEMORANDUM for Tuesday 12/6 1904
Take Stock Steel Goods
for Mr. Ford - Send memorandum
Goods wanted, to his address at
Columbus O.

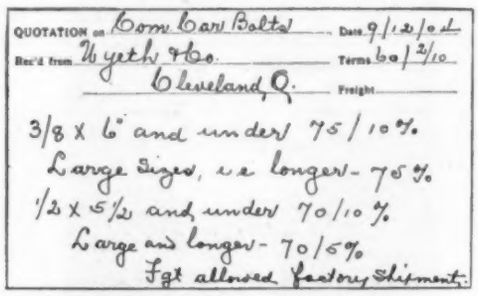



MEMORANDUM for 11/6 190 4

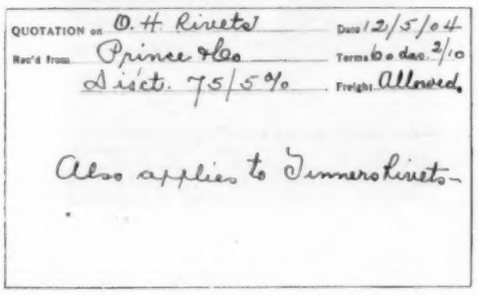
Notify all Newspaper offices to return Advertising cuts after 10th of month.

Two forms of quotation or price slips are furnished in connection with the "Quotations" division, Fig. 4, of the Record, both of the slips being especially designed for making note of quotations, prices of goods, with particulars in regard to house making the quotation, date, freight, terms, &c. Some illustrations of the use of these two forms of quotation slips are afforded in the reproductions of filled out slips presented herewith.

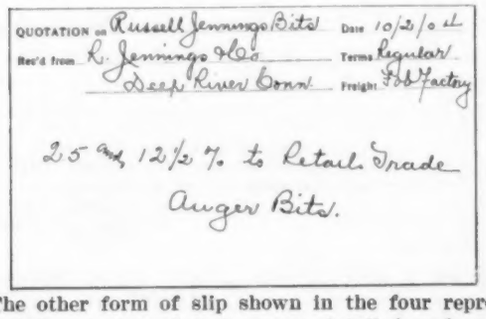
For instance, the three reproductions below are of the form of slip which might perhaps be used for off-hand or informal notation of quotations made by traveling salesmen. If a salesman quoted a discount of 75 and 5 and 5 per cent. on Machine Bolts this would be noted on such slip, which would then be put in its proper place in the "Quotations" division of the Record:


QUOTATION on Comm. Carr Bolts Date 9/12/04
Rec'd from Wyeth & Co. Terms 60/2/10
Cleveland, O. Freight

3/8 X 6" and under 75/10%.
Large Sizes, ie longer - 75%.
1/2 X 5 1/2 and under 70/10%.
Large and longer - 70/5%.
Fgt allowed factory Shipment.

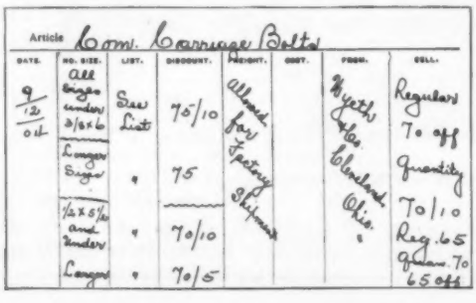

QUOTATION on O. H. Rivets Date 12/5/04
Rec'd from Prince & Co. Terms 60 days 2/10
Discts. 75/5% Freight Allowed.

Also applies to Tinners Rivets.

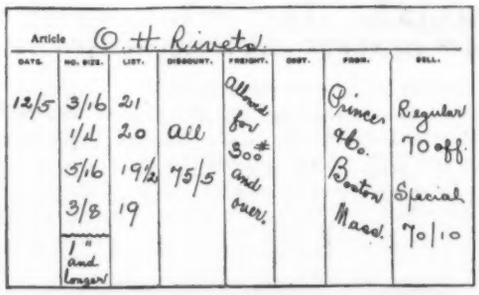

QUOTATION on Russell Jennings Bits Date 10/2/04
Rec'd from L. Jennings & Co. Terms Regular
Deep River Conn. Freight F.O.B. Factory

25 and 12½% to Retail Trade
Auger Bits.

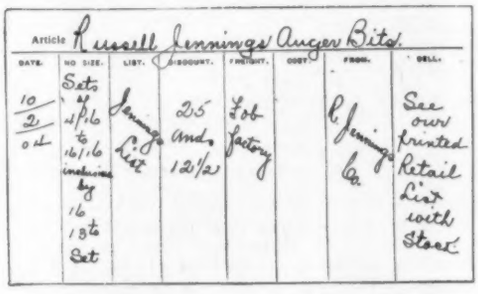
The other form of slip shown in the four reproductions below is intended for more detailed and careful notation of quotations, and in some cases at least would be made up from the former slips. For instance, the slips relating to Common Carriage Bolts, O. H. Rivets and Russell Jennings Bits are made up from the informal slips illustrated above, which would then be destroyed.


Article Comm. Carriage Bolts

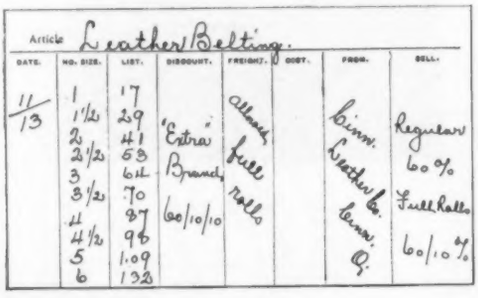
DATE.	NO. SIZE.	LIST.	DISCOUNT.	FREIGHT.	COST.	FROM.	SELL.
9/12/04	All sizes under 3/8 x 6	See List	75/10	Allowed for Factory Shipment		Wyeth & Co. Cleveland, Ohio.	Regular 70 off Quantity
	Longer Sizes	"	75				
	1/2 x 5 1/2 and under	"	70/10				70/10 Reg. 65 Qu. 70 65 off
	Longer	"	70/5				


Article O. H. Rivets

DATE.	NO. SIZE.	LIST.	DISCOUNT.	FREIGHT.	COST.	FROM.	SELL.
12/5	3/16	21	All	Allowed for 300# and over.		Prince & Co. Boston Mass.	Regular 70 off Special 70/10
	1/4	20					
	5/16	19½	75/5				
	3/8	19					
	1" and longer						


Article Russell Jennings Auger Bits.

DATE.	NO SIZE.	LIST.	DISCOUNT.	FREIGHT.	COST.	FROM.	SELL.
10/2/04	Sets of 4/16 to 16/16 increasing by 1/16 to Set	Jennings List	25 and 12½	Fob factory		L. Jennings Co.	See our printed Retail List with Steel


Article Leather Belting.

DATE.	NO. SIZE.	LIST.	DISCOUNT.	FREIGHT.	COST.	FROM.	SELL.
11/13	1	17	"Extra" Brand, 60/10/10	Allowed full rolls		Conn. Leather Co. Conn.	Regular 60% Full Rolls 60/10%
	1½	29					
	2	41					
	2½	53					
	3	64					
	3½	70					
	4	87					
	4½	96					
	5	1.09					
	6	132					

PRICE OF RECORD
$6, DELIVERED.

It is therefore obvious that with this method of recording prices the merchant is at all times in a position easily to keep track of and refer to quotations in which he is interested.

The card index method of keeping track of prices is commending itself more and more to the trade, and merchants are finding out by experience its many advantages on account of its flexibility, facility of use and general convenience.

The HARDWARE MERCHANT'S CARD INDEX RECORD is furnished complete with 1500 assorted blank slips, 5 x 3 inches in size, of the three forms shown in the foregoing illustrations. Price, $6, express charges prepaid. Address *The Iron Age*, 232-238 William street, New York.

DEATH OF ROBERT J. ALEXANDER.

ROBERT J. ALEXANDER of the firm of Sperry & Alexander, 300 Broadway, New York, died suddenly of heart failure Sunday, March 12, while South on business, at Jupiter, Fla. Mr. Alexander was about 42 years old, and was well known in the Cutlery trade with which he was identified. Mr. Alexander began business as a boy with C. B. Barker, and later was with the Howard Cutlery Company. The present firm were located at 10 Warren street for some years previous to establishing themselves at their present address in 1900. Mr. Alexander had been ailing since last fall, and started on his usual Southern trip with some reluctance. On arriving at New Orleans, by the advice of a specialist he discontinued his business trip and joined his wife at Jupiter, where she was visiting his partner's family.

THE FRUIT-OHL HARDWARE COMPANY, Sharon, Pa., has re-elected Edwin N. Ohl of Pittsburgh president and C. H. Wiltsie secretary and treasurer. The company, which has a Delaware charter with a capital of $100,000, will apply for a Pennsylvania charter.

CONNECTICUT STATE RETAIL HARDWARE DEALERS' ASSOCIATION.

THE second annual meeting of the Connecticut State Retail Hardware Dealers' Association was held at Hotel Hartford, Hartford, on the 7th inst., with a large attendance. Late trains delayed the arrival of many of the members, including President W. A. Church, so that it was noon before the association was called to order,

CHAS. G. AGARD.

and when dinner and brief post prandial speaking were concluded it was too late for an afternoon meeting. It was suggested by Mr. Church that hereafter two or three days be given to the annual meeting, and this will probably be done.

President Church, in calling the meeting to order, congratulated the association on the work that has been accomplished and the influence exerted directly and in-

GEORGE J. BASSETT.

directly during the past year. Secretary James De F. Phelps, Windsor Locks, read his report of the year, and it was accepted, together with that of the treasurer, Lewis B. Crosby, New London.

New Officers.

The following Committee on Nominations was appointed by the chair to bring in a list of officers for the ensuing year: H. T. Clark, J. J. Lyon, F. T. Terry, George J. Bassett, Eli C. Birdsey. The committee presented the following list of officers, who were unanimously elected:

PRESIDENT, Charles G. Agard, Torrington.
FIRST VICE-PRESIDENT, George J. Bassett, New Haven.
SECOND VICE-PRESIDENT, Irving C. Treat, Hartford.
SECRETARY, James De F. Phelps, Windsor Locks.
TREASURER, Lewis B. Crosby, New London.
DIRECTORS FOR THREE YEARS: W. A. Church, Derby; Eli C. Birdsey, Meriden; D. B. Wilson, Waterbury; A. W. Davenport, Stamford.

On motion of A. H. Abbe a vote of thanks was extended Mr. Church, the retiring president, and on motion of Mr. Church a similar vote was passed in appreciation of the work accomplished by Secretary Phelps.

Mutual Insurance.

Mr. Birdsey, as chairman of the Committee on Insurance, repeated, on request, something of the report read at the summer meeting on Hardware mutual fire insurance, and A. H. Abbe joined him in warm indorsement of the economy and safety of those institutions.

D. N. Clark, I. C. Treat and A. H. Bishel were appointed the Auditing Committee for the year.

A resolution was introduced by Mr. Abbe, and unanimously adopted, protesting against the passage of a bill

IRVING C. TREAT.

which he stated had received favorable action in committee, lessening the responsibilities of common carriers for merchandise in Connecticut. The resolution follows:

Resolved, That the Connecticut State Retail Hardware Dealers' Association protest against the passage by the Connecticut Legislature of any measure relieving common carriers from responsibility from danger or loss of merchandise while in transit, and that the chair appoint a committee of two to co-operate with the State Business Men's Association and the State Board of Trade in appearing before the legislative committee in opposition to such legislation.

President Agard appointed L. L. Rosenberg and G. I. Clapp to act with the secretary in this matter.

Size of Catalogues.

George J. Bassett spoke of the inconvenience resulting from the wide variation in size of catalogues ranging from the size of a small card to that of a standard dictionary. He agreed that the large catalogues could not take the standard size, but considered that manufacturers generally would do a great kindness to the trade by adopting a uniform size. He presented the following motion, which was accepted:

Voted, That this association is in favor of a uniform size, approximately 6 x 9 inches, for all unbound Hardware catalogues, and that we recommend this size to all Hardware manufacturers through the columns of the trade journals, and that this recommendation be also sent to the National Hardware Association and the National Retail Hardware Dealers' Association.

It was voted that the association send Secretary Phelps as its delegate to the convention of the National Association at Minneapolis March 14, 15 and 16.

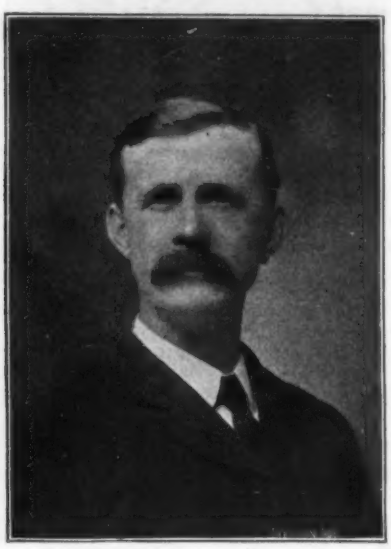
Parcels Post.

The matter of proposed changes in the postal laws was briefly touched upon by L. L. Rosenberg and A. H. Abbe. The latter spoke of the fallacy contained in the prevailing idea that a saving in postal charges to retail merchants would be an important one, when, as a matter of

JAMES DE F. PHELPS.

fact, a change in existing laws to accomplish such saving would mean great loss through catalogue house competition everywhere. As a result of the brief discussion Connecticut Senators and Congressmen will undoubtedly be informed of the association's stand in the matter.

Dinner was served at 1.30 o'clock, after which there were brief remarks by Mr. Church and a talk by R. U.



LEWIS B. CROSBY.

Conger of the Sheldon School of Scientific Salesmanship, Chicago, on "Salesmanship as an Applied Science."

The Attendance.

Those present were:

F. T. Terry, T. P. Terry & Son, Ansonia.
M. E. Weldon, S. A. Weldon & Son, Bristol.
J. R. Hill, A. R. Jones, Danbury Hardware Company, Danbury.
F. W. Hallock, W. A. Church, F. Hallock & Co., Derby.
R. E. Page, Hartford.
R. C. Wittee, Hartford.
J. C. Woolley, Woolley Hardware Company, Hartford.
I. C. Treat, George I. Clapp, Clapp & Treat, Hartford.
W. D. Williams, H. M. Robinson, Tracy, Robinson & Williams Company, Hartford.
E. M. Francis, Francis & Co., Hartford.
A. H. Bishel, Smith & Bishel, Middletown.
E. C. Birdsey, Birdsey & Raven, Meriden.
D. H. Hough, Eaton, Chase & Co., Norwich.
J. M. Page, G. D. Buck, John M. Page & Co., Naugatuck.
George J. Bassett, the John E. Bassett & Co., New Haven.
George H. Baker, George H. Baker & Co., New Haven.
E. M. Walsh, R. B. Bradley Company, New Haven.
A. G. Gruener, W. A. Warner, Bro. & Co., New Haven.
L. L. Rosenberg, L. L. Rosenberg Company, New Haven.
J. J. Lyon, Lyon & Ewald, New London.
L. B. Crosby, G. M. Williams Company, New London.
C. M. Beach, New Milford.
A. H. Abbe, A. H. & E. W. Abbe, New Britain.
H. L. Mills, New Britain.
F. A. Farrar, F. T. Blish Hardware Company, South Manchester.
A. W. Davenport, J. S. Davenport & Sons, Stamford.
Lockwood & Palmer, Stamford.
D. N. Clark, Shelton.
T. M. Lyon, H. Chapman & Co., Stafford Springs.
Charles G. Agard, Agard Hardware Company, Torrington.
W. B. Dickerman, H. E. Dickerman, Dickerman Hardware & Supply Company, Wallingford.
D. B. Wilson, Waterbury.
Hotchkiss & Templeton, Waterbury.
Herbert T. Clark, Willimantic.
F. D. Jordan, Jordan Bros., Willimantic.
G. M. Mervin, Dickerman & Pond Company, Winsted.
J. L. Carroll, Winsted.
J. De F. Phelps, Alfred Bergman, F. S. Bidwell & Co., Windsor Locks.
H. A. Hitchcock, H. L. Blakeslee, F. F. Hitchcock & Son, Woodbury.
Benjamin J. Fisher, George W. Downs, New Jersey Wire Cloth Company, Trenton, N. J.
A. S. Howe, Dover Mfg. Company, Canal Dover, Ohio.
John Nelson, *The Iron Age*.

PRICE-LISTS, CIRCULARS, &c.

Manufacturers in Hardware and related lines are requested to send us duplicate copies of catalogues, price-lists, &c., one copy for our Catalogue Department in New York and another for our London office; and at the same time to call our attention to any new goods or additions to their lines, of which appropriate mention will be made besides the brief reference to the catalogue or price-list in this column.

N. R. DAVIS & SONS, Assonet, Mass.: Post card calling attention to the Davis Guns as manufactured of the best materials and in a thorough and practical manner.

NORTH BROTHERS MFG. COMPANY, Philadelphia, Pa.: Catalogue of Yankee Tools, including Ratchet Screw Drivers, Spiral Ratchet Screw Drivers, Automatic Drills, Reciprocating Drill, Pocket Magazine Screw Driver, Tool Set, &c.

LOGAN & STROBRIDGE IRON COMPANY, New Brighton, Pa.: Circulars relating to Lemon Squeezers, Ice Shredders and Shaves, Ice Picks and Ice Chisels.

ALEXANDER BROTHERS, Philadelphia, Pa.: Booklet relating to the Alexander Leather Belting.

SCHOENING HARDWARE COMPANY, St. Louis, Mo.: Catalogue entitled "Our Advisor," containing illustrations and "low prices" of specialties, good until May 31. It covers Gasoline Stoves, Ovens, Screen Doors and Windows, Garden Tools, Washers, Lawn Mowers, Lawn Swings, Varnishes, Rubber Hose, &c.

JAMES KEEVES & SONS' NEW CATALOGUE.

JAMES KEEVES & SONS, Boundary street and Calvert avenue, Shoreditch, London, N. E., England, who are wholesale and export Ironmongers, Cutlery and Tool Merchants, as well as manufacturers of Tin, Iron and Japanned Ware, have recently issued a revised edition of their illustrated catalogue. There are 610 pages, each 8½ x 10¾ inches, with 45 columns of index matter, and the book is profusely illustrated. The diversity of goods shown and the wide assortment may be inferred from the large index, many American made goods appearing in the pages. Accompanying the catalogue is a small bound book, 4 x 5½ inches, containing 24 addressed postal cards, conveniently arranged on one side for an order, a manifold copy being obtained by using a carbon sheet provided.

Millea's Emergency Tool.

A tool which occupies little space in the mechanic's kit and is adapted for a variety of work is shown herewith as manufactured by the Universal Tool Company, Springfield, Mass. It is made of the best drop forged steel and is designed for hard usage. Although weighing less than 1 pound and but 7 inches in length, it is well adapted for hard service in many lines. It is of excellent workmanship and finished in nickel plate. One of the applications is shown in the illustration. It is also adapted for use as a wire cutter, a monkey wrench, a pipe wrench, a pipe cutter, a nail puller, a screw driver, a bench vise and die stock, a tap wrench or bit stock and a hand vise. On the under side of the jaws a notch is shown in which wire can be inserted and cut off by turning the thumb screw at the bottom. In the center of this thumb screw at the bottom the projecting edge of the screw driver can be seen, and it is only necessary to run the thumb screw up in order to let it project far enough for use. The little wheel for cutting the pipe can be seen in the center of the wrench, which serves for a tap wrench and hand vise, or for holding a small die for cutting a thread. The monkey wrench is at the left, and the teeth for a pipe wrench are at the right.

General View.

One of the Applications.

Millea's Emergency Tool.

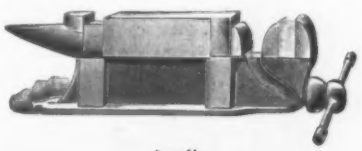
Ideal 30-40 Shell Chamfering Reamer.

The Ideal Mfg. Company, New Haven, Conn., is manufacturing the Ideal 30-40 shell chamfering reamer here illustrated. The reamer is made of tool steel, hardened, tempered and ground to proper shape. This implement is designed for chamfering the inner sharp edge of the muzzle of 30-40 Krag shells when reloading with cast alloyed bullets, which is very essential to prevent the sharp edge of the muzzle of the shell from cutting or scraping the softer bullet when being inserted. It is observed that the ammunition manufacturers performed this operation on all shells before the metallic covered bullets were used, and they continue to do so still in all cases where the hard metal covered bullets are to be inserted. They have, however, omitted the operation in shells where metal covered bullets are used, but such shells should be chamfer reamed when they are to be reloaded with cast bullets.

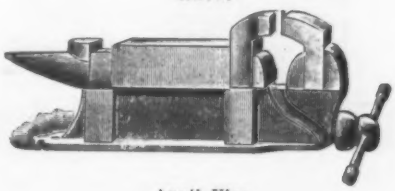
Ideal 30-40 Shell Chamfering Reamer.

The Hanson Combination Vise.

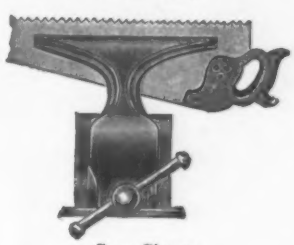
The combination vise herewith illustrated is made by the Stowell Mfg. & Foundry Company, South Milwaukee, Wis. It consists of five tools in one, anvil, anvil vise, saw clamp, drill and pipe vise. The combination of the vise is such that the various tools can be quickly applied and readily changed, there being no screws or bolts to rust or get lost. All of the tools are packed together in a neat wooden box, and the complete outfit weighs about 60 pounds.



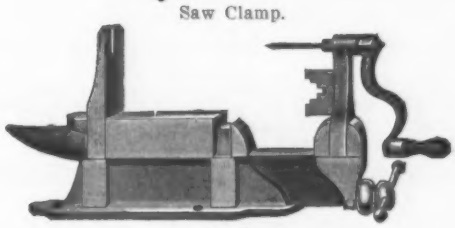
Anvil.



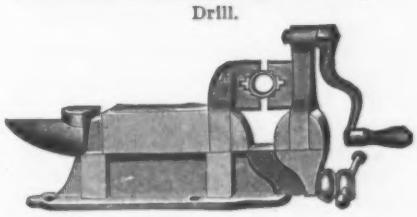
Anvil Vise.



Saw Clamp.



Drill.

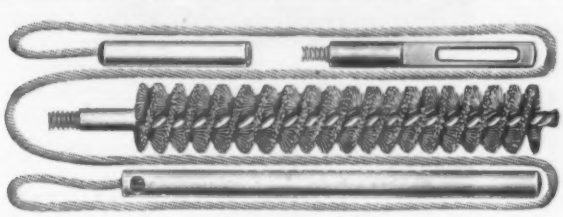


Pipe Vise.

The Hanson Combination Vise.

Rifle Cleaner.

J. Stevens Arms & Tool Company, Chicopee Falls, Mass, is making the United States Government rifle cleaner here illustrated. It consists of a bristle brush and slotted wiper with detachable cord and weight for dropping through the rifle barrel. A separate slotted wiper is also supplied for pulling through a dry cloth and for oiling the inside of barrel. The cleaner can be furnished for .22, .25, .30, .32, .38 and .44 calibers, and additional calibers not mentioned to .50, inclusive, but no larger, with a delay of two to four weeks, all regular and special at a uniform price.



United States Government Rifle Cleaner.

Machinists' Swivel Clamp and Iron Level.

The Athol Machine Company, Athol, Mass., has recently supplemented its line of mechanics' fine tools by the addition of the machinists' swivel clamp and double plumb iron level here illustrated. The machinists' swivel

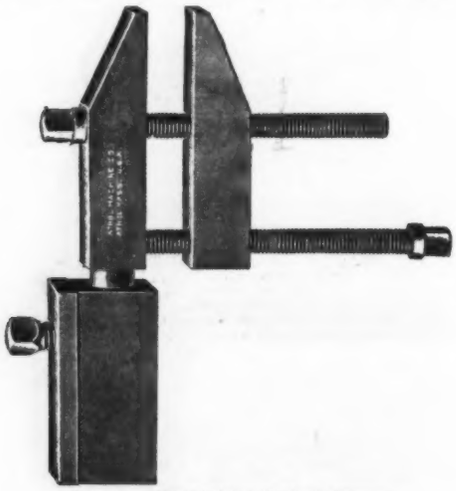


Fig. 1.—Machinists' Swivel Clamp.

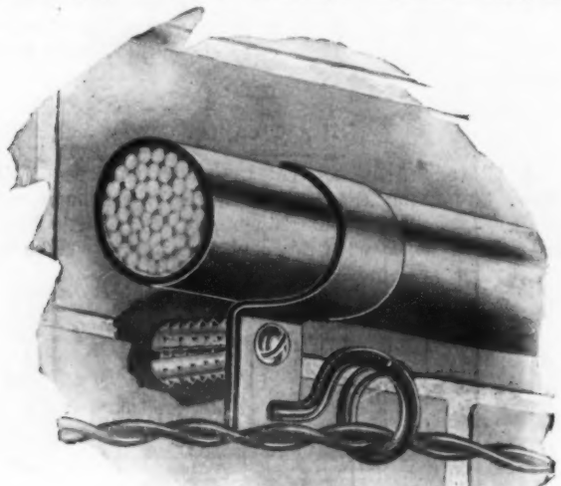
clamp, Fig. 1, is a convenience especially adapted to vise work, where it is often desirable or necessary to change position of work to make it more accessible to file or other tool. The holder can be inserted in the vise jaws and so remain, a swivel motion being obtained by loosening the set screw and relocking clamp portion in an altered posi-

Fig. 2.—Carpenters' and Machinists' Iron Level.

tion. Fig. 2 illustrates the No. 35 carpenters' and machinists' iron levels, with double plumb. Sizes 6, 9 and 12 inches long have square ends, the 18 and 24 inch sizes differing slightly on the ends in appearance only. The base is grooved for cylindrical work, both groove and base being accurate.

Long-Saut Cable Clamp.

The Diamond Expansion Bolt Company, 9-15 Murray street, New York, is marketing the Long-Saut cable clamp in connection with the company's expansion bolt, as

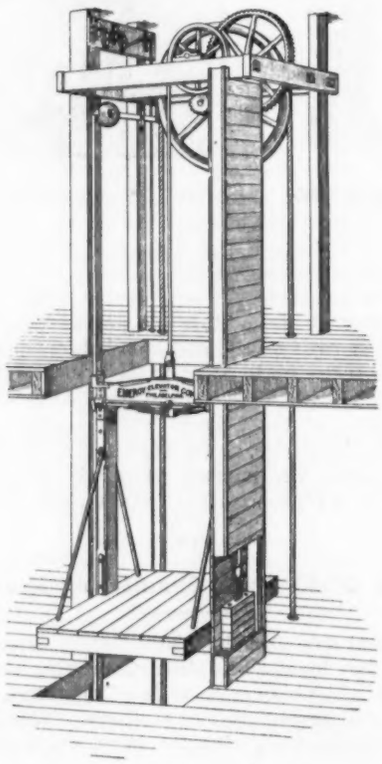


Long Saut Cable Clamp and Expansion Bolt.

shown herewith. This device is designed to provide a secure fastening for attaching pipe conduits or lead covered cables to brick, stone, concrete or wood, as well as a support for bridle rings to carry bridle wires. The clamps are heavily galvanized and made in four sizes for carrying lead covered cable from ¾ to 2 inches in diameter. The bridle rings are made with machine thread for screwing into the clamp and can be furnished in either galvanized, brass or enamel finish. The clamps will not dent or injure the lead covered cable in any way. But one expansion shield, furnished with clamp if desired, is required for fastening this clamp to the masonry. This, it is pointed out, effects a great saving, as one less drilled hole is required than when using spike dogs and separate bridle rings, and the clamps cost less than the other articles. Other advantages alluded to by the company are that cable clamps put up with Diamond expansion bolts can be taken down without injury to the conduit and that it can be used alike for attachment to wood or stone walls, instead of compelling a lineman to carry strap hangers and screws for wood and spike cable dogs for stone. Still another feature of this form of construction is that the expansion shields used with the clamp can also be used with standard bridle rings when it is desired to set them separate from the clamps.

A New Hand Elevator.

The Energy Elevator Company, 411 Cherry street, Philadelphia, is placing on the market the new hand elevator shown herewith. The machines have large rope



A New Hand Elevator.

wheels, keyed to steel shafts, which revolve on steel antifriction roller bearings. The spur wheels are cast from cut patterns of extra length to insure durability, and the cable wheels are double heavy and spoke ribbed for the same purpose. The main shafts are of turned steel of large diameter, so as to resist the tortional strain to which they are subjected, these shafts all resting on self oiling bearings. The elevator is equipped with a self holding brake, released or applied from any floor. The Energy safety attachment, with which these elevators are also equipped, is sure in action and will lock the car instantly in case of breakage of the cable. The cable is made of Swedish iron, capable of sustaining a load five times the rated capacity of the car, whereby the possibility of breakage is reduced to a minimum.

Wright-Brown Hardware Company, Wyoming, Ill., has increased its capital stock from $10,000 to $20,000.

Van Wagoner Top o' Door Spring Hinge

The Van Wagoner Company, Cleveland, Ohio, and 107 Chambers street, New York, has just put on the market the Van Wagoner ball bearing Top o' Door pivot spring hinge, here shown, Fig. 1 representing it complete for installation, of which only the rectangular plate shows on both sides of door when fitted. Fig. 2 illustrates all the

Fig. 1.—Van Wagoner Ball Bearing Top o' Door Pivot Spring Hinge.

parts and the relation they bear to each other. The company calls attention to a number of special advantages, including the ball bearings, which take both weight and side thrust, said to be peculiar to this hinge; working parts in door at top out of reach of dust and wet; ease of adjustment of spring power; perfect alignment of door and decreased expense of application. Much of the fitting is accomplished by boring auger holes, and the working mechanism being at top of door, the cutting of large holes in the floor is avoided. It is also pointed out that the hinge can often be applied where a bottom hinge could not, as, for instance, where iron beams are near the floor, or where stone sills or thresholds are used, or in connection with concrete and tile floors. There are two ball bearings in the top portion of the hinge and one in the lower door socket. The door is aligned by removing the side plates, which exposes the lining up screws marked X in Fig. 2. The hinges are sent out with tension set for general use, but greater or less tension can be easily applied to meet varying conditions. The upper plate or head jamb socket and likewise the lower plate or floor socket are made so as to locate the holes for pivots, the ball bearing door socket being an angle piece applied to lower back edge of door, which simplifies the carpenters' work and obtains a location of parts easily. The construction also permits of very close work in fitting doors and the pivots are near the jamb piece, which leaves little space between jamb and door when open.

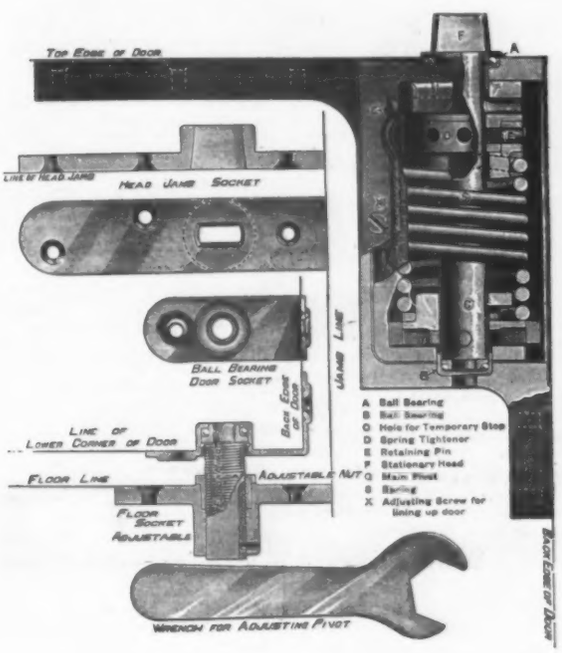


Fig. 2.—Sectional View of Hinge.

The hinges are made in planished steel, polished steel and bronze or brass in a great variety of finishes. There are four sizes, Nos. 1, 2, 3 and 4—viz., for door thicknesses of ⅞ to 1⅜, 1⅜ to 1¾, 1¾ to 2½ and 2½ to 3½ inches.

PAINTS, OILS AND COLORS

White Lead, Zinc, &c.—

	₱ lb
Lead, English white, in Oil	9½@ 9¼
Lead, American white, in Oil:	
Lots of 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
In Barrels	@ 6
Lead, White, in oil, 25 lb tin pails, add to keg price	@ ½
Lead, White, in oil, 12½ lb tin pails, add to keg price	@ 1
Lead, White, in oil, 1 to 5 lb assted tins, add to keg price	@ 1½

Lead, American. Terms: For lots 12 tons and over ¼¢ rebate; and 2% for cash if paid in 15 days from date of invoice; for lots of 500 lbs. and over 1% for cash if paid in 15 days from date of invoice, for lots of less than 500 lbs. net.

	₱ lb
Lead, White, Dry in bbls	@ 6
Zinc, American, dry	4¾@ 4¾
Zinc, French:	
Paris, Red Seal, dry	8½
Paris, Green Seal, dry	9½
Antwerp, Red Seal, dry	7½
Antwerp, Green Seal, dry	8⅞
Zinc, V. M. French, in Poppy Oil: Green Seal:	
Lots of 1 ton and over	11⅞@12⅝
Lots of less than 1 ton	12⅛@12⅝
Zinc, V. M. French, in Poppy Oil: Red Seal:	
Lots of 1 ton and over	10⅝@11⅛
Lots of less than 1 ton	10⅞@11⅜

Discounts.—French Zinc.—Discounts to buyers of 10 bbl. lots of one or mixed grades 1%; 25 bbls., 2%; 50 bbls., 4%.

Dry Colors—

	₱ lb
Black, Carbon	5 @10
Black, Drop, Amer	4 @ 6
Black, Drop, Eng	5 @15
Black, Ivory	16 @20
Lamp, Com	4½@ 6
Blue, Celestial	4 @ 6
Blue, Chinese	29 @32
Blue, Prussian	27 @30
Blue, Ultramarine	4½@15
Brown, Spanish	¼@ 1
Carmine, No. 40	$3.55@4.00
Green, Chrome, ordinary	3½@ 6
Green, Chrome, pure	17 @25
Lead, Red, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Litharge, bbls., ½ bbls. and kegs:	
Lots 500 lb or over	@ 6½
Lots less than 500 lb	@ 7
Ocher, American	₱ ton $8.50@16.00
Orcher, American Golden	2½@ 3½
Orcher, French	1¾@ 2¼
Orcher, Foreign Golden	3 @ 4
Orange Mineral, English	8¾@10½
Orange Mineral, French	10½@11¼
Orange Mineral, German	7¾@10
Orange Mineral, American	8 @ 8¼
Red, Indian, English	4½@ 8½
Red, Indian, American	3 @ 3¼
Red, Turkey, English	4 @10
Red, Tuscan, English	7 @10
Red, Venetian, Amer.	₱ 100 lb $0.50@1.25
Red Venetian, English	100 lb $1.15@1.75
Sienna, Italian, Burnt and Powdered	3 @ 9½
Sienna, Ital., Raw, Powd	3 @ 6½
Sienna, American, Raw	1½@ 2
Sienna, American, Burnt and Powdered	1½@ 2
Talc, French	₱ ton $20.00@30.00
Talc, American	₱ ton 16.00@25.00
Terra Alba, French	₱ 100 lb 90 @1.00
Terra Alba, English	₱ 100 lb 90 @1.00
Terra Alba, American, ₱ 100 lb., No. 1	.60 @70
Terra Alba, American, ₱ 100 lb., No. 2	.45 @50
Umber, T'key, Bnt. & Pow	2½@ 3½
Umber, Turkey, Raw & Pow	2½@ 3½
Umber, Burnt, Amer	1½@ 2
Umber, Raw, Amer	1½@ 2
Yellow, Chrome	11 @14
Vermilion, American Lead	10 @25
Vermilion, Quicksilver, bulk	@65
Vermilion, Quicksilver, bags	@66
Vermilion, English, Import	75 @80
Vermilion, Chinese	$0.90@1.00

Colors in Oil—

	₱ lb
Black, Lampblack	12 @14
Blue, Chinese	36 @46
Blue, Prussian	32 @36
Blue, Ultramarine	13 @16
Brown, Vandyke	11 @14
Green, Chrome	10 @15
Green, Paris	@24
Sienna, Raw	12 @15
Sienna, Burnt	12 @15
Umber, Raw	11 @14
Umber, Burnt	11 @14

Miscellaneous—

Barytes, White, Foreign	₱ ton $17.50@19.00
Barytes, Amer. floated	₱ ton 17.00@19.00
Barytes, Crude, No. 1	₱ ton 10.00@11.00
Chalk, in bulk	₱ ton 3.00@ 3.25
Chalk, in bbls	₱ 100 lb @ .35
China Clay, English	₱ ton 11.00@17.00
Cobalt, Oxide	₱ 100 lb 2.50@
Whiting, Common	₱ 100 lb .45@ .48
Whiting, Gilders	₱ 100 lb .55@ .57
Whiting, Ex. Gilders	₱ 100 lb .58@ .60

Putty—

	₱ 100 lb
In bladders	$1.70
In bulk	1.05@1.10
In cans, 1 lb to 5 lb	2.00@2.90
In cans, 12½ to 50 lb	1.40@1.55

Spirits Turpentine— ₱ gal.

In Oil bbls	54½@55
In machine bbls	55 @55½

Glue—

	₱ lb
Cabinet	11 @15
Common Bone	6 @ 8
Extra White	18 @24
Foot Stock, White	11 @14
Foot Stock, Brown	7 @10
German Hide	12 @18
French	10 @40
Irish	13 @16
Low Grade	8 @11
Medium White	14 @17

Gum Shellac—

	₱ lb
Bleached Commercial	31 @32
Bone Dried	41 @42
Button	36 @45
Diamond I	30 @32
Fine Orange	40 @45
A. C. Garnet	34 @35
D. C	1.10@1.20
Octagon B	45 @50
T. N	33 @35
V. S. O	53 @..

Animal, Fish and Vegetable Oils—

	₱ gal.
Linseed, City, raw	47 @48
Linseed, City, boiled	49 @50
Linseed, State and West'n, raw	45 @46
Linseed, raw Calcutta seed	@55
Lard, Prime, Winter	57 @59
Lard, Extra No. 1	48 @49
Lard, No. 2	36 @38
Cotton-seed, Crude, f.o.b. mills	19½@20
Cotton-seed, Summer Yellow, Prime	26 @26½
Cotton-seed, Summer Yellow, off grades	25½@26
Sperm, Crude	60 @..
Sperm, Natural Spring	@..
Sperm, Bleached Spring	@..
Sperm, Natural Winter	62 @64
Sperm, Bleached Winter	65 @67
Tallow, Prime	48 @50
Whale, Crude	@..
Whale, Natural Winter	45 @..
Whale, Bleached Winter	47 @..
Menhaden, Brown, Strained	27 @28
Menhaden, Light, Strained	29 @30
Menhaden, Bleached, Winter	31 @32
Menhaden, Ex-Bld. Winter	33 @34
Menhaden, Southern	19 @..
Cocoanut, Ceylon	₱ lb 6¾@ 6½
Cocoanut, Cochin	₱ lb 6¾@ 7¼
Cod, Domestic, Prime	34 @36
Cod, Newfoundland	39 @41
Red Elaine	31 @33
Red Saponified	₱ lb 4¼@ 4⅜
Olive, Italian, bbls	54 @58
Neatsfoot, prime	50 @51
Palm, Logos	₱ lb 5¼@ 5½

Mineral Oils—

	₱ gal.
Black, 29 gravity, 25@30 cold test	10¼@11½
Black, 29 gravity, 15 cold test	11½@12½
Black, Summer	10½@11½
Cylinder, light filtered	18 @19
Cylinder, dark filtered	16 @17
Paraffine, 903-907 gravity	12½@13
Paraffine, 903 gravity	11½@12
Paraffine, 883 gravity	9¼@ 9½
Paraffine, Red	11¼@13

In small lots ½¢ advance.

Current Hardware Prices.

General Goods.—In the following quotations General Goods—that is, those which are made by more than one manufacturer—are printed in *Italics*, and the prices named, unless otherwise stated, represent those current in the market as obtainable by the fair retail Hardware trade, whether from manufacturers or jobbers. Very small orders and broken packages often command higher prices, while lower prices are frequently given to larger buyers.

Special Goods.—Quotations printed in the ordinary type (Roman) relate to goods of particular manufacturers, who are responsible for their correctness. They usually represent the prices to the small trade, lower prices being obtainable by the fair retail trade, from manufacturers or jobbers.

Range of Prices.—A range of prices is indicated by means of the symbol @. Thus 33⅓ @ 33⅓ & 10% signifies that the price of the goods in question ranges from 33⅓ per cent. discount to 33⅓ and 10 per cent. discount.

Names of Manufacturers.—For the names and addresses of manufacturers see the advertising columns and also THE IRON AGE DIRECTORY, issued May, 1904, which gives a classified list of the products of our advertisers and thus serves as a DIRECTORY of the Iron, Hardware and Machinery trades.

Standard Lists.—A new edition of "Standard Hardware Lists" has been issued and contains the list prices of many leading goods.

Additions and Corrections.—The trade are requested to suggest any improvements with a view to rendering these quotations as correct and as useful as possible to Retail Hardware Merchants.

Adjusters, Blind—
Domestic, ℔ doz. $3.00 ..... 33⅓%
North's 10%
Zimmerman's—See Fasteners, Blind.

Window Stop—
Ives' Patent 35%
Taplin's Perfection 35%

Ammunition— See *Caps, Cartridges, Shells, &c.*

Anvils—American—
Eagle Anvils ..... ℔ lb 7¼@7¾¢
Hay-Budden, Wrought ..... 9@9¼¢
Horseshoe brand, Wrought ..... 9@9¼¢
Trenton ..... ℔ lb 9@9¼¢

Imported—
Peter Wright & Sons ..... ℔ lb 10½¢

Anvil, Vise and Drill—
Millers Falls Co., $18.00 ..... 15&10%

Apple Parers— See *Parers, Apple, &c.*

Aprons, Blacksmiths'—
Hull Bros. Co. ..... 30&10%
Livingston Nail Co. 33⅓%

Augers and Bits—
Com. Double Spur ..... 70&10%
Boring Mach. Augers ..... 70&10%
Car Bits, 12-in. twist ..... 50&10%
Jennings' Pattern ..... 70&10%
Ford's Auger and Car Bits ..... 40&5%
Forstner Pat. Auger Bits 25%
C. E. Jennings & Co.:
No. 10 ext. lip, R. Jennings' list..25%
No. 30, R. Jennings' list ..... 40&7½%
Russell Jennings' ..... 25&10&2½%
L'Hommedieu Car Bits 15%
Mayhew's Countersink Bits 45%
Millers Falls ..... 50&20&7½%
Ohio Tool Co.'s Bailey Auger and Car Bits ..... 40&10%
Pugh's Black 20%
Pugh's Jennings' Pattern 30%
Snell's Auger Bits 60%
Snell's Bell Hangers' Bits 60%
Snell's Car Bits, 12-in. twist ..... 60&10%
Wright's Jennings' Bits (R. Jennings' list) 50%

Bit Stock Drills—
See *Drills, Twist.*

Expansive Bits—
Clark's small, $18; large, $26 ..... 50&10%
Clark's Pattern, No. 1, ℔ doz. $36; No. 2, $18 ..... 50&10%
Ford's, Clark's Pattern ..... 50&10&60%
C. E. Jennings & Co., Steer's Pat. 25%
Swan's 60%

Gimlet Bits—
Per gro.
Common Dble. Cut ..... *$3.00@3.25*
German Pattern, Nos. 1 to 10, $4.60; 11 to 13, $5.75

Hollow Augers—
Bonney Pat., per doz. $9.00@10.00
Ames ..... 25&10%
New Patent ..... 25&10%
Universal 20%
Wood's Universal 25%

Ship Augers and Bits—
Ford's ..... 33⅓@5%
C. E. Jennings & Co.:
L'Hommedieu's 15%
Watrous' ..... 35&5%
Ohio Tool Co.'s 40%
Snell's 40%

Awl Hafts— See *Hafts, Awl.*

Awls—
Lrad Awls:
Handled ..... *gro. $2.75@3.00*
Unhdled, Shldered ..... *gro.63@66¢*
Unhandled, Patent ..... *gro.66@70¢*
Peg Awls:
Unhandled, Patent ..... *gro. 31@34¢*
Unhdled, Shldered ..... *gro. 65@70¢*
Scratch Awls:
Handled, Com ..... *gro. $3.50@4.00*
Handled, Socket ..... *gro.$11.50@12.00*
Hurwood 40%

Awl and Tool Sets—See *Sets, Awl and Tool.*

Axes—
Single Bit, base weights, (up to 3½ lb.)
First Quality *$6.50*
Second Quality *$6.00*
NOTE.—Heavier Weights add Extras as per regular schedule.

Axle Grease— See *Grease, Axle*

Axles— *Iron or Steel*
Concord, Loose Collar ..... *4¼@4¾¢*
Concord, Solid Collar ..... *4¾@5¼¢*
No. 1 Common, Loose ..... *3¼@3¾¢*
No. 1½ Com., New Style 3¾@4¼¢
No. 2 Solid Collar ..... *4@4½¢*
Nos. 7, 8, 11 and 12 ..... *75@75&5%*
Nos. 13 to 14 ..... *70&10@75&5%*
Nos. 15 to 18 ..... *75&10@75&10&5%*
Nos. 19 to 22 ..... *75&10@75&10&5%*

Boxes, Axle—
Common and Concord, not turned lb.,4½@5¢
Common and Concord, turned. lb., 5½@6¢
Half Patent ..... *lb. 8½@9¢*

Bait— Fishing—
Hendryx:
A Bait 20%
B Bait 25%
Competitor Bait ..... 20&5%

Balances— Sash—
Caldwell new list 50%
Pullman ..... 50&10@60%

Spring—
Spring Balances ..... *60@60&5%*
Chatillon's:
Light Spg. Balances ..... 40&10%
Straight Balances 40%
Circular Balances 50%
Large Dial 30%

Barb Wire—See *Wire, Barb.*

Bars— Crow—
Steel Crowbars, 10 to 40 lb. ..... per lb., 2¾@3¼¢

Towel
No. 10 Ideal, Nickel Plate ..℔ gro. $8.50

Beams, Scale—
Scale Beams ..... *40&10@50%*
Chattillon's No. 1 ..... 30%
Chattillon's No. 2 ..... 40%

Beaters, Carpet—
Holt-Lyon Co.:
No. 12 Wire Coppered ℔ doz. $0.85; Tinned $1.00
No. 11 Wire Coppered ℔ doz. $1.10; Tinned $1.20
No. 10 Wire Galvanized ..℔ doz. $1.75
Western W. G. Co.:
No. 1 Electric ..... ℔ gro. $7.80
No. 2 Buffalo ..... ℔ gro. $9.00
No. 3 Perfection Dust ..... ℔ gro. $8.00

Egg—
Holt-Lyon Co.:
Holt, No. A, Japanned ..... ℔ doz. $1.20
Holt, No. 1, Tinned ..... ℔ doz. $1.50
Holt, No. B, Japanned ..... ℔ doz. $2.00
Holt, No. 2, Tinned ..... ℔ doz. $2.25
Lyon, No. 2, Japanned ..... ℔ doz. $1.25
Lyon, No. 3, Japanned ..... ℔ doz. $1.50
Taplin Mfg. Co.: ..... ℔ gro.
No. 60 Improved Dover $6.00
No. 75 Improved Dover $6.50
No. 100 Improved Dover $7.00
No. 102 Improved Dover, Tin'd ..$8.50
No. 150 Improved Dover, Hotel ..$15.00
No. 152 Imp'd Dover, Hotel, T'd.$17.00
No. 200 Imp'd Dover Tumbler $8.50
No. 202 Imp'd Dover Tumbler, T'd.$9.50
No. 300 Imp'd Dover Mammoth, ℔ doz. $25.00
Western, W. G. Co., Buffalo $7.00
Wonder (S. S. & Co.) ..℔ gro. net, $6.00

Bellows—
Blacksmith, Standard List.. 60&10@70&10%

Blacksmiths'—
Inch.. 30 32 34 36 38 40
Each.$3.25 3.50 4.00 4.50 5.00 5.75
Extra Length:
Each.$3.75 4.25 4.75 5.25 6.00 7.00

Hand—
Inch... 6 7 8 9 10
Doz...$4.50 5.00 5.50 6.00 6.50

Molders—
Inch. 9 10 11 12 14
Doz.$8.00 9.00 10.50 12.50 14.50

Net Prices.

Bells— Cow—
Ordinary goods ..... *75&5@75&10&5%*
High grade ..... *70&10@70&10&5%*
Jersey ..... 75&10%
Texas Star 50%

Door—
Abbe's Gong 45%
Burton Gong 50%
Home, R. & E. Mfg. Co.'s ..... 55&10%
Lever and Pull, Sargent's ..... 60&10&10%
Trip Gong ..... 50&10@50&10&5%
Yankee Gong 55%

Hand—
Hand Bells, Polished, Brass.. 60&5@60&10&5%
White Metal *60%*
Nickel Plated ..... *50&10@50&10&5%*
Swiss ..... *60@60&7½%*
Cone's Globe Hand Bells ..... 33⅓@35%
Silver Chime ..... 33⅓@35%

Miscellaneous—
Farm Bells ..... *lb. 2¼¢*
Steel Alloy Church and School 50&10&5@60&5%
American Tube & Stamping Co. Gongs 75%
Table Call Bells ..... 50@50&10%

Belting— Leather—
Extra Hvy, Short Lap ..... *60@60&5%*
Regular Short Lap ..... *65&10@70%*
Standard ..... *70&5@70&10%*
Light Standard ..... *70&10@75%*
Cut Leather Lacing ..... *60&10%*
Leather Lacing Sides, per sq. ft. 17½@18¢

Rubber—
Agricultural (Low Grade) ..... *75@75&5%*
Common Standard ..... *70@70&10%*
Standard ..... *65&70%*
Extra ..... *60&5@60&10%*
High Grade ..... *50&5@50&10%*

Bench Stops—
See *Stops, Bench*

Benders and Upsetters, Tire—
Detroit Perfected Tire Bender 40%
Green River Tire Benders and Upsetters 20%
Detroit Stoddard's Lightning Tire Upsetters, No. 1, $4.25; No. 2, $7.25; No. 3, $10.50; No. 4, $16.25; No. 5, $20.50.

Bicycle Goods—
John S. Leng's Son's 1902 list:
Chain 50%
Parts 50%
Spokes 50%
Tubes 60%

Bits—
Auger, Gimlet, Bit Stock Drills, &c.—See *Augers and Bits.*

Blocks— Tackle—
Common Wooden ..... *70&10@75&5%*
Hartz St. Tackle Blocks ..... 50&50&5%
Hollow Steel Blocks, with Ford's Patent Sheaves ..... 50&10%
Lane's Patent Automatic Lock and Junior 30%
Stowell's Novelty, Mal. Iron ..... 50&10%
Stowell's Self Loading 60%
See also Machines, Hoisting.

Boards, Stove—
Zinc, Crystal, &c ..... *30&10@40&10%*

Boards, Wash—
See *Washboards.*

Bobs, Plumb—
Keuffel & Esser Co. 33⅓%

Bolts—
Carriage, Machine, &c.—
Common Carriage (cut thread):
⅜ x 6 and Smaller ..... *75&2½%*
Larger and longer *70%*
Phila. Eagle $3.00 list May 24,'99 80%
Bolt Ends, list Feb. 14, '95 ..... *70&5%*
Machine, ⅜ x 4 and smaller 75&5%
Machine, larger and longer.. 70&7½%

Door and Shutter—
Cast Iron Barrel, Japanned, Round Brass Knob:
Inch..... 3 4 5 6 8
Per doz.$0.30 .35 .45 .56 .75
Cast Iron Spring Foot, Jap'd:
Inch..... 6 8 10
Per doz..... $1.15 1.40 2.00
Cast Iron Chain, Flat, Japanned:
Inch..... 6 8 10
Per doz..... $0.95 1.25 1.55
Cast Iron Shutter, Japanned, Brass Knobs:
Inch..... 6 8 10
Per doz..... $0.80 .90 1.20
Wrt Barrel Japd ..... *80@80&10%*
Wrt " Bronzed ..... *50@50&10%*
Wrt. Spring ..... *70&10@70&10&10%*
Wrt. Shutter ..... *50&5@50&10&5%*
Wrt. Square Neck ..... *75@75&10%*
Wrt Square 66⅔&10@68⅔&10&10%
Iron Patent Door *50%*

Stove and Plow—
Plow ..... *65&10@65&10&10%*
Stove ..... *82½&10@82½&10&5%*

Tire—
Common *80%*
Norway Iron *80%*
American Screw Company:
Norway Phila., list Oct. 16, '84..80
Eagle Phila., list Oct. 16, '84....80
Bay State, list Dec. 28, '99..... 80
Franklin Moore Co.:
Norway Phila., list Oct. 16, '84...80
Eagle Phila., list Oct. 16, '84....80
Eclipse, list Dec. 28, '99..... 80
Russell, Burdsall & Ward Bolt & Nut Co.:
Empire, list Dec. 28, '99..... 80
Norway Phila., list Oct., '84..... 80
Upson Nut Co.:
Tire Bolts 70%
Borers, Tap—
Borers Tap, Ring, with Handle:
Inch..... 1¼ 1½ 1¾ 2
Per doz...$4.80 5.60 6.40 8.00
Inch 2¼ 2½
Per doz $8.65 11.50
Enterprise Mfg. Co., No. 1, $1.25; No. 2, $1.65; No. 3, $2.50 each 25
Boxes, Mitre—
C. E. Jennings & Co. 30
Langdon ..... 15&10
Perfection ..... ℔ doz. $3.00
Schatz 40
Stanley R. & L. Co.:
Nos. 240 to 460 30
Nos. 50 and 60 35
Braces—
Common Ball, American..$1.25@1.50
Barber's ..... 50&10&10@60&10%
Fray's Genuine Spofford's 60%
Fray's No. 70 to 120, 81 to 123, 207 to 414 60
C. E. Jennings & Co. ..... 50&5
Mayhew's Ratchet 50
Mayhew's Quick Action Hay Pat. 50
Millers Falls Drill Braces ..... 25&10
P., S. & W. Co., Peck's Pat. ..... 60&10@65
Stanley R. & L. Co.:
Stanley 35
Victor 45
Brackets—
Wrought Steel ..... *80&10@80&10&5%*
Bradley's Wire Shelf:
Full cases ..... 80&10&10
Broken cases ..... 80&10
Griffin's Pressed Steel 80
Griffin's Folding Brackets ..... 70&10
Stowell's Cast Shelf 75
Stowell's Sink 50
Western, W. G. Co., Wire ..... 60&10
Bright Wire Goods—
See *Wire and Wire Goods.*
Broilers—
Kilbourne Mfg. Co. ..... 75&20
Western, W. G. Co. 80
Wire Goods Co. ..... 75@75&10
Buckets, Galvanized—
Price per dozen.

Quart	*10*	*12*	*14*
Water, Regular	*1.40*	*1.70*	*1.90*
Water, Heavy	*3.40*	*3.70*	*3.80*
Fire, Rd. Bottom	*2.30*	*2.55*	*2.97*
Well	*2.55*	*2.87*	*3.15*

Bucks, Saw—
Hoosier ..... ℔ gro. $36.00
Bull Rings—See *Rings, Bull*
Butts— Brass—
Wrought, list Sept., '96 ..... *90%*
Cast Brass, Tiebout's 50%
Cast Iron—
Fast Joint, Broad ..... *40&10@50%*
Fast Joint, Narrow ..... *40&10@50%*
Loose Joint ..... *70&10@75%*
Loose Pin ..... *70&10@75%*
Mayer's Hinges ..... *70@70&5%*
Parliament Butts ..... *70@70&5%*
Wrought Steel—
Table and Back Flaps *75%*
Narrow and Broad *75%*
Inside Blind *75%*
Loose Pin *75%*
Loose Pin, Jap'd ..... *70&10%*
Loose Pin, Ball and Steeple Tip *85%*
Japanned Ball Tip Butts ..... *70&10%*
Bronzed, Wrt., Nar. and Inside Blind Butts ..... *65&10%*

Cages, Bird—
Hendryx, Brass:
3000, 5000, 1100 series 5%
1200 series 33⅓%
200, 300, 600 and 900 series ..... 40&10%

Hendryx Bronze:
700, 800 series.....40&10%
Hendryx Enameled.....40&10%

Calipers—See *Compasses.*

Calks, Toe and Heel—

*Blunt, 1 prong.....per lb.*44¼¢
*Sharp, 1 prong...per lb.*4½@4¾¢
Gautier, Blunt.....4@4¼¢
Gautier, Sharp.....4½@4¾¢
Perkins', Blunt Toe.....₱ lb 3.65¢
Perkins', Sharp Toe.....₱ lb 4.15¢

Can Openers—

See *Openers, Can.*

Cans, Milk—

	5	8	10 gal.
Illinois Pattern.....	$1.35	1.85	2.05 each.
New York Pattern..	1.50	2.20	2.45 each.
Baltimore Pattern..	1.50	2.20	2.45 each.
Dubuque	1.35	1.60	1.75 each.

Cans, Oil—

Buffalo Family Oil Cans:

3	5	10 gal.
$18.00	60.00	129.60 gro., net.

Caps, Percussion—

Eley's E. B.....52@55¢
G. D.....per M 34@35¢
F. L.....per M 40@42¢
G. E.....per M 48@50¢
Musket .....per M 62@63¢

Primers—

Berdan Primers, $2 per M...20%
B. L. Caps (Sturtevant Shells) $2 per M.....20%
All other primers per M.$1.52@1.60

Cartridges—

Blank Cartridges:
32 C. F., $5.50.....10&5%
38 C. F., $7.00.....10&5%
22 cal. Rim, $1.50.....10&5%
32 cal. Rim, $2.75.....10&5%
B. B. Caps, Con. Ball, Swgd..$1.90
B. B. Caps, Round Ball....$1.49
Central Fire.....25%
Target and Sporting Rifle..15&5%
Primed Shells and Bullets.15&10%
Rim Fire, Sporting.....50%
Rim Fire, Military.....15&5%

Casters—

Bed .....70@70&10%
Plate .....60&10@60&10&5%
Philadelphia .....75@75&10%
Acme, Ball Bearing.....33⅓%
Boss .....70&10%
Boss Anti-Friction.....70&10%
Gem (Roller Bearing).....80%
Martin's Patent (Phoenix).....45%
Standard Ball Bearing.....45%
Tucker's Patent low list.....30%
Yale (Double Wheel) low list.....50%

Cattle Leaders—

See *Leaders, Cattle.*

Chain, Coil—

American Coil, Straight Link:

3-16	¼	5-16	⅜	7-16	½	9-16
7.40	5.10	4.15	3.45	3.30	3.20	3.15
⅝	¾	⅞	1 to 1¼ inch,			
3.10	3.00	2.95	2.95 per 100 lb.			

German Coil.....60&10&10@70%

Halters and Ties—

Halter Chains...60&10@60&10&10%
German Pattern Halter Chains, list July 24, '97.....60&10&10%
Cow Ties.....60@60&10%

Trace, Wagon, &c.—

Traces, Western Standard: 100 pr.
6½—6-3, Str'ght, with ring..$23.50
6½—6-2, Str'ght, with ring..$24.50
6½—8-2, Str'ght, with ring..$28.00
6½—10-2, Str'ght, with ring..$32.00

NOTE.—Add 2c per pair for Hooks. Twist Traces 2c per pair higher than Straight Link.

Trace, Wagon and Fancy Chains .....60&5@60&10&5%

Miscellaneous—

Jack Chain, list July 10, '93:
Iron .....60&10@60&10&5%
Brass .....60&10@60&10&10%
Safety Chain.....75@75&10&5%
Gal. Pump Chain.....lb. 5@5¼%
Covert Mfg. Co.:
Breast .....40&2%
Halter .....40&2%
Heel .....40&2%
Rein .....40&2%
Stallion .....40&2%
Covert Sad. Works:
Breast 70%
Halter 70%
Hold Back.....70%
Rein 70%
Oneida Community:
Am. Coil and Halters.....40@40&5%
Am. Cow Ties.....45@50%
Eureka Coil and Halter....45@50&5%
Niagara Coil and Halter....45@50&5%
Niagara Cow Ties.....45&5@50&10&5%
Niagara Wire Dog Chains..45@50&5%
Wire Goods Co.:
Dog Chain.....70&10%
Universal Dbl.-Jointed Chain.....50%

Chalk—(From Jobbers.)

Carpenters' Blue.....gro. 35@38¢
Carpenters' Red.....gro. 30@33¢
Carpenters' White....gro. 25@28¢
See also Crayons.

Checks, Door—

Bardsley's 45%
Columbia .....50&10%
Eclipse .....60&10%

Chests, Tool—

American Tool Chest Co.:
Boy's Chests, with Tools.....55%
Youths' Chests, with Tools.....40%
Gentlemen's Chests, with Tools..30%
Farmers', Carpenters', etc., Chests, with Tools.....20%
Machinists' and Pipe Fitters' Chests, Empty.....50%
Tool Cabinets.....50%
C. E. Jennings & Co.'s Machinists' Tool Chests.....33⅓&10%

Chisels—Socket Framing and Firmer

Standard List.....70&10@75&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Socket Firmer No. 10.....60%
C. E. Jennings & Co. Socket Framing No. 15.....60%
Ohio Tool Co.'s.....70%
Swan's 70%
L. & I. J. White.....30@30&5%

Tanged—

Tanged Firmers....40&5@40&10%
Buck Bros.....30%
Charles Buck.....30%
C. E. Jennings & Co. Nos. 191, 181..25%
L. & I. J. White, Tanged.....25&5%

Cold—

	lb.
Cold Chisels, good quality	*13@15¢*
Cold Chisels, fair quality	*11@12¢*
Cold Chisels, ordinary	*9@10¢*

Chucks—

Beach Pat., each $8.00.....35&5%
Pratt's Positive Drive.....25%
Empire 25%
Blacksmiths' 25%
Skinner Patent Chucks:
Independent Lathe Chucks.....50%
Universal 50%
Combination 50%
Drill Chucks, New Model.....30%
Drill Chucks, Standard.....45%
Drill Chuck, Skinner Pat., 0, 1, 2.35%
Drill Chucks, Skinner Pat., 3, 4, 5, 6, 7, 8.....35%
Drill Chucks, Positive Drive.....30%
Planer Chucks.....25%
Face Plate Jaws.....40%
Standard Tool Co.:
Improved Drill Chuck.....45%
Union Mfg. Co.:
Combination 50%
Czar Drill.....35%
Combination Geared Scroll.....40%
Geared Scroll.....40%
Independent 50%
Independent Steel.....40%
Union Drill.....45%
Universal 50%
Independent Iron F. Plate Jaws.40%
Independent Steel F. Plate Jaws.40%
Westcott Patent Chucks:
Lathe Chucks.....50%
Little Giant Auxiliary Drill.....50%
Little Giant Double Grip Drill..50%
Little Giant Drill, Improved.....50%
Oneida Drill.....50%
Scroll Combination Lathe.....50%

Clamps—

Adjustable, Hammers'.....20@20&5%
Cabinet, Sargent's.....50&10%
Carriage Makers', P. S. & W. Co..50%
Carriage Makers', Sargent's.....60%
Besly, Parallel.....33⅓&10%
Lineman's, Utica Drop Forge & Tool Co.....40%
Saw Clamps, see Vises, Saw Filers'.

Cleaners, Drain—

Iwan's Champion, Adjustable.....55%
Iwan's Champion, Stationary.....45%

Sidewalk—

Star Socket, All Steel..₱ doz. $4.05 net
Star Shank, All Steel..₱ doz. $3.24 net
W. & C. Shank, All Steel, ₱ doz., 7½ in., $3.00; 8 in., $3.25.

Cleavers, Butchers'—

Foster Bros.....30%
New Haven Edge Tool Co.'s.....45%
Fayette R. Plumb.....33⅓@33⅓&10%
L. & I. J. White.....30%

Clippers—

Chicago Flexible Shaft Company:
'96 Chicago Horse.....$6.75 } 15%
1902 Chicago Horse.....10.75 }
20th Century Horse, each, $5.00...20%
Lightning Belt.....$15.00 }
Chicago Belt.....$20.00 } 15%
Stewart's Patent Sheep, $12.75....20%

Finger Nail Clippers—

Smith & Hemenway Co.₱ doz. net $2.00

Clips, Axle—

Eagle, 5-16 and ⅜ in..75@75&10%
Norway, 5-16 and ⅜ in..60&10@70%

Cloth and Netting, Wire—See *Wire, &c.*

Cocks, Brass—

Hardware list: Compression, Plain Bibbs, Globe, Kerosene, Racking, &c., Cocks.....70&10@75%

Coffee Mills—

See *Mills, Coffee.*

Collars, Dog—

Nickel Chain, Walter B. Stevens & Son's list.....40%
Leather, Walter B. Stevens & Son's list.....40%

Combs, Curry—

Metal Stamping Co.....40%

Mane and Tail—

Covert's Saddlery Works.....60&10%

Compasses, Dividers, &c.

Ordinary Goods.....75&5@75&10%
Bemis & Call Hdw. & Tool Co.:
Dividers 65%
Calipers, Double.....65%
Calipers, Inside or Outside.....65%
Calipers, Wing.....60%
Compasses 50%

Conductor Pipe, Galva.—

L. C. L. to Dealers:

Territory.	*Nested.*	*Not nested.*
A Eastern	*75&5%*	*75%*
B, Eastern	*75&10%*	*75&5%*
Central	*75&5%*	*70&10&5%*
Southern	*70&7½%*	*70&12½%*
S. Western	*70&5%*	*70%*

Terms, 60 days; 2% cash 10 days. Factory shipments generally delivered.
See also Eave Troughs.

Coolers, Water—

Gal. each..	2	3	4	6	8
Labrador ...	$1.20	$1.50	$1.80	$2.10	$2.70
Gal.	3	4	6	8	
Iceland, ea.	$1.80	$2.10	$2.40	$3.00	
Gal.	2	3	4	6	8
Galv. Lined, ea.	$1.85	$2.00	$2.25	$2.90	$3.90 25%

Gavl. Lined, side handles,

Gal.	2	3	4	6	8
Each.	$1.95	$2.15	$2.40	$3.30	$4.15..25%

Coopers' Tools—

See *Tools, Coopers'.*

Cord—Sash—

Braided, Drab.....lb. 35¢
Braided White, Com.lb..21@22½%
Cable Laid Italian..... lb., A, 18¢; B, 16¢
Common India.....lb. 10@10½¢
Cotton Sash Cord, Tw'ted..11@17¢
Patent Russia.....lb...@14¢
Cable Laid Russia....lb...@15¢
India Hemp, Braided..lb...@18¢
India Hemp, Twisted..lb. 12@13¢
Patent India, Twisted.lb. 12@13¢
Anniston Cordage Co.: Braided Cotton.
Old Glory, Nos. 7 to 12....₱ lb 23 ¢
Anniston, Nos. 7 to 12....₱ lb 22 ¢
Old Colony, Nos. 7 to 12..₱ lb 22 ¢
Anniston Drab, Nos. 7 to 12.₱ lb 26 ¢
Pearl Braided, cotton, No. 6, ₱ lb, 25½¢; No. 7, 21½¢; Nos. 8 to 12, 21¢
Eddystone Braided, Nos. 7, 8, 9 and 10 .....₱ lb 24 ¢
Eddystone Braided Cotton, No. 6..₱ lb 25 ¢
Harmony Cable Laid Italian, Nos. 7 to 10.....₱ lb 23 ¢
Peerless:
Cable Laid Italian.....16 ¢
Cable Laid Russian.....14 ¢
Cable Laid India.....12 ¢
Braided India.....18 ¢
Samson, Nos. 8 to 12:
Braided, Drab Cotton.....₱ lb 40 ¢
Braided, Italian Hamp....₱ lb 40 ¢
Braided, Linen.....₱ lb 55 ¢
Braided, White Cotton or Spot.... ₱ lb 35 ¢
Massachusetts, White.....₱ lb 28 ¢
Massachusetts, Drab.....₱ lb 32 ¢
Phoenix, White, Nos. 8 to 12, 24¢; No. 7, 24½¢; No. 6, 25½¢.
Silver Lake:
A quality, Drab.....40 ¢
A quality, White.....35 ¢
B quality, Drab.....35 ¢
B quality, White.....30 ¢
Italian Hemp.....40 ¢
Linen .....57½ ¢

Wire, Picture—

List Oct., '00.....
85&10&10@85&10&10&5%
Hendryx Standard Wire Picture Cord, 85&10&5%

Cradles—

Grain .....40&12½%

Crayons—

White Round Crayons, gr. 5½@6¢
Cases, 100 gro., $4.00, at factory.
D. M. Steward Mfg. Co.: (Case lots, 20%)
Jumbo Crayons.....gr. $3.50
Metal Workers' Crayons, gr. $2.50
Soapstone Pencils, round, flat or square .....gr. $1.50
Rolling Mill Crayons.....gr. $2.50
Railroad Crayons (composition) gr. $2.00
Zelnicker's Lumber:
Red, Blue, Green.....₱ gro. $6.50
Black .....₱ gro. $4.00
See also Chalk.

Crooks, Shepherds'—

Fort Madison, Heavy.....₱ doz. $7.00
Fort Madison, Light.....₱ doz. $6.50

Crow Bars—See *Bars, Crow.*

Cultivators—

Victor Garden.....50%

Cutlery, Table—

International Silver Company:
No. 12 M'd'm Knives, 1847..₱ doz. $3.50
Star, Eagle, Rogers & Hamilton and Anchor .....₱ doz. $3.00
Wm. Rogers & Son.....₱ doz. $2.50

Cutters—Glass—

H. H. Mayhew Co.....40%
Red Devil.....50%
Smith & Hemenway Co.....50%
Woodward 40%

Meat and Food—

American 30%

Nos.	1	2	3	4	B	5
Each.	$5	$7	$10	$25	$50	$60

Enterprise .....25@25&7½%

Nos.	5	10	12	22	32
Each	$2	$3	$2.75	$4.50	$6

Dixon's .....₱ doz. 30&10@40%

Nos.	1	2	3	4
	$14.00	$17.00	$19.00	$30.00

Ideal .....40&10@50%
Little Giant.....₱ doz. 33⅓@40%

Nos.	305	310	312	320	322
	$35.00	$48.00	$44.00	$72.00	$68.00

N. E. Food Choppers.....40%
New Triumph No. 605, ₱ doz. $24.00.. 30&10@40%
Russwin Food, No. 1, $24.00; No. 2, $27.00 .....45&10&10%
Woodruff's .....₱ doz. 30&10@40%

Nos.	100	150
	$15.00	$18.00

Enterprise Beef Shavers.....25@30%

Slaw and Kraut—

Henry Disston & Sons:
Slaw, Corn Grater, &c.....40%
Kraut Cutters, 24 x 7, 26 x 8, 30 x 9.....55%
Kraut Cutters, 36 x 12, 40 x 12....40%
J. M. Mast Mfg. Co.:
Slaw Cutters, 1 Knife....₱ doz. $3.00
Combined Slaw Cutter and Corn Grater .....₱ doz. $4.00
Tucker & Dorsey Mfg. Co.:
Kraut Cutters.....40%
Slaw Cutters, 1 Knife..₱ gr. $18@$20
Slaw Cutters, 2 Knife..₱ gr. $22@$36

Tobacco—

All Iron, Cheap..doz. $4.25@$4.50
Enterprise .....25&30%
National, ₱ doz., No. 1, $21; No. 2, $18 .....40%
Sargent's, ₱ doz., No. 2.....60%
Sargent's, Nos. 12 and 21.....60&10%

Washer—

Appleton's, ₱ doz., $16.00....50&10&10%

Diggers, Post Hole, &c.—

Dalbey Post Hole Auger..per doz., $9.00
Iwan's Imp'ved Post Hole Auger.40&5%
Iwan's Vaughan Pattern Post Hole Augers .....₱ doz. $6.25
Iwan's Perfection Post Hole Digger.. ₱ doz. $8.25
Iwan's Split Handle Post Hole Diggers .....₱ doz. $7.25
Kohler's Universal.....₱ doz. $15.00
Kohler's Little Giant.....₱ doz. $12.00
Kohler's Hercules.....₱ doz. $10.00
Kohler's Invincible.....₱ doz. $9.00
Kohler's Rival.....₱ doz. $8.00
Kohler's Pioneer.....₱ doz. $7.20
Never-Break Post Hole Diggers, ₱ doz., $24.00.....60%
Samson, ₱ doz. $34.00.....25%

Dividers—See *Compasses.*

Doors, Screen—

Phillips', style E, ⅞ in....₱ doz. $10.00
Phillips', style 077, ⅞ in....₱ doz. $7.50
Phillips', style x-y, ⅞ in....₱ doz. $10.50

Drawers, Money—

Tucker's Pat. Alarm Till No. 1, ₱ doz., $18; No. 2, $15; No. 3, $12; No. 4, $18.

Drawing Knives—

See *Knives, Drawing.*

Dressers, Emery Wheel—

Diamond Emery Wheel Dressers....35%
Diamond Wheel Dresser Cutters....35%

Drills and Drill Stocks—

Common Blacksmiths' Drill, each .....$1.50@$1.75
Breast, Millers Falls.....15&10%
Breast, P., S. & W.....40&5%
Goodell Automatic Drills..40&5@40&10%
Johnson's Automatic Drills, Nos. 2 and 3.....16⅔%
Johnson's Drill Points.....16⅔%
Millers Falls Automatic Drills.33⅓&10%
Ratchet, Curtis & Curtis.....25%
Ratchet, Parker's.....40%
Ratchet, Weston's.....33⅓%
Ratchet, Whitney's, P., S. & W..50%
Whitney's Hand Drill, No. 1, $10.00; Adjustable, No. 10, $12.00.....33⅓%

Twist Drills—

Bit Stock.....60&10@60&10&10%
Taper and Straight Shank.... 60&10@60&10&5%

Drivers, Screw—

Screw D'ver Bits, per doz..45@60¢
Balsey's Screw Holder and Driver, ₱ doz., 2½-in., $6; 4-in., $7.50; 6-in., $9 .....40%
Buck Bros.' Screw Driver Bits.....30%
Champion 50%
Edson 60%
Fray's Hol. H'dle Sets, No. 3, $12..50%
Gay's Double Action Ratchet.....35%
Goodell's Auto..50&10&10@50&10&10&5%
Hurwood 40%
Mayhew's Black Handle.....40%
Mayhew's Monarch.....40&10%
Millers Falls, Nos. 20 and 21..25&10%
Millers Falls, Nos. 11, 12, 41, 42..15&10%
Never Turn.....60%
New England Specialty Co.....50%
Sargent & Co.'s:
Nos. 1 and 60.....50&10&10%
Nos. 50 and 55.....60&10%
Nos. 20 and 40.....70&10%
Smith & Hemenway Co.....40&5%
H. D. Smith & Co.'s Perfect H'dle.40%
Stanley R. & L. Co.'s:
No. 64, Varn. Handles.....65%
No. 86.....75%
Victor 55%
Defiance 70%
Swan's:
Nos. 65 to 68.....50%
No. 40.....40&10%
Nos. 25, 35 and 45.....20&10&10%

Eave Trough, Galvanized—

Territory.	*L. C. L.*
A, Eastern	*80&7½%*
B, Eastern	*80&12½%*
Central	*80&7½%*
Southern	*70&20&10%*
S. Western	*75&12½%*

Terms.—2% for cash. Factory shipments generally delivered.
See also Conductor Pipe and Elbows.

Elbows and Shoes—

Factory shipments:
Plain Rd., and Rd., Cor., 2, 3 and 4 in.....75%
Plain Rd., and Rd., Cor., 5 and 6 in.....60%
Perfect Elbows (S., S. & Co.).....40%

Emery, Turkish—

	4 to 6	*5½ to 180*	*Flour*
Kegs .....lb.	*5 ¢*	*5½¢*	*3½¢*
½ Kegs.....lb.	*5½¢*	*5¾¢*	*3¾¢*
¼ Keys.....lb	*5½¢*	*6 ¢*	*4 ¢*
10-lb. cans, 10 in case....	*6½¢*	*7 ¢*	*6 ¢*
10-lb. cans, less than 10.....	*10 ¢*	*10 ¢*	*8 ¢*
Less quantity..	*10 ¢*	*10 ¢*	*8 ¢*

NOTE.—In lots 1 to 3 tons a discount of 10% is given.

Extractors, Lemon Juice—See *Squeezers, Lemon.*

Fasteners, Blind—

Zimmerman's .....50&10%
Walling's 45%

Cord and Weight—

Ives 40%

Faucets—

Cork Lined.....50@50&10%
Metallic Key, Leather Lined..
60&10@70%
Red Cedar.....40&10@50%
Petroleum.....70&10@75%
B. & L. B. Co.:
Metal Key.....60&10%
Star.....60%
West Lock.....50&10%
John Sommer's Peerless Tin Key....40%
John Sommer's Boss Tin Key.....50%
John Sommer's Victor Mtl. Key.50&10%
John Sommer's Duplex Metal Key..60%
John Sommer's Diamond Lock.....40%
John Sommer's I.X.L. Cork Lined...50%
John Sommer's Reliable Cork Lined..
50&10%
John Sommer's Chicago Cork Lined.60%
John Sommer's Q. K. Cork Lined...60%
John Sommer's No Brand, Cedar....50%
John Sommer's Perfection, Cedar....40%
McKenna, Brass:
Burglar Proof, N. P.....25%
Improved, ¾ and ⅞ inch.....25%
Self Measuring:
Enterprise, ℔ doz. $36.00.....40&10%
Lane's, ℔ doz. $36.00.....40&10%
National Measuring, ℔ doz. $36.40&10%

Felloe Plates—

See *Plates, Felloe.*

Files— Domestic—

List revised Nov. 1, 1899.
Best Brands.....70&10@75&5%
Standard Brands.75&10@75&10&10%
Lower Grade....75&10&10@80&10%

Imported—

Stubs' Tapers, Stubs' list, July 24, '97.....33 1-3@40%

Fixtures, Fire Door—

Richards Mfg. Co.:
Universal, No. 103.....$4.00
Special, No. 104.....$4.00
Fusible Links.....$0.25
Expansion Bolts.....50&10%

Grindstone—

Net Prices:

Inch	*15*	*17*	*19*	*21*	*24*
Per doz.	*$2.15*	*2.85*	*3.25*	*3.75*	*4.50*

P., S. & W. Co.....30&10@40%
Reading Hardware Co.....60%
Sargent's.....70%
Stowell's Giant Grindstone Hanger..
℔ doz. $6.00
Stowell's Grindstone Fixtures, Extra Heavy.....50&10&10%
Stowell's Grindstone Fixtures, Light.
60&10%

Fodder Squeezers—

See *Compressors.*

Forks—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Iowa Dig-Ezy Potato.....60&10%
Victor, Hay.....60&15&2½%
Victor, Manure.....66%
Victor, Header.....65%
Champion, Hay.....66%
Champion, Header.....65%
Champion, Manure.....60&15&2½%
Columbia, Hay.....60&20%
Columbia, Manure.....70%
Columbia, Spading.....70&12½%
Hawkeye Wood Barley.....40%
W. & C. Potato Digger.....60&10%
Acme Hay.....60&20%
Acme Manure, 4 tine.....60&10&5%
Dakota Header.....60&20%
Jackson Steel Barley.....60&20%
Kansas Header.....65%
W. & C. Favorite Wood Barley.....40%
Plated.—See Spoons.

Frames— Saw—

White, S'g't Bar, per doz.75@80¢
Red, S'g't Bar, per doz..$1.00@1.25
Red, Dbl. Brace, per doz.$1.40@1.50

Freezers, Ice Cream—

Qt.	*1*	*2*	*3*	*4*	*6*
Each	*$1.25*	*$1.60*	*$1.90*	*$2.20*	*$2.80*

Fruit and Jelly Presses—

See *Presses, Fruit and Jelly.*

Fry Pans—See *Pans, Fry.*

Fuse— *Per 1000 Feet.*

Hemp.....$2.75
Cotton.....3.20
Waterproof Sgl. Taped..3.65
Waterproof Dbl. Taped..4.40
Waterproof Tpl. Taped..5.15
10&2½%

Gates, Molasses and Oil—

Stebbins' Pattern.80&10@80&10&5%

Gauges—

Marking, Mortise, &c......
50&10&5@50&10&10&5%
Chapin-Stephens Co.:
Marking, Mortise, &c.50&10@50&10&10%
Scholl's Patent.....50&10@50&10&10%
Door Hangers.....50@50&10%
Stanley R. & L. Co.'s Butt and Rabbet Gauge.....35%
Marking and Mortise.....60%
Wire, Brown & Sharpe's.....25%
Wire, Morse's.....25%
Wire, P., S. & W. Co.....30&10%

Gimlets— Single Cut—

Numbered assortments, per gro.
Nail, Metal, No. 1, $2.00; 2, $2.30
Spike, Metal, No. 1, $4.00; 2, $4.30
Nail, Wood Handled, No. 1, $2.30; 2, $2.60
Spike, Wood Handled, No. 1, $4.30; 2, $4.60

Glass, American Window

See *Trade Report.*

Glasses, Level—

Chapin-Stephens Co.....60@60&10&10%

Glue, Liquid Fish—

Bottles or Cans, with Brush..
25@50%
Cans (½ pts., pts., qts., ½ gal., gal.).....25@48%
International Glue Co. (Martin's)...
40&10%

Grease, Axle—

Common Grade....*gro. $4.50@5.50*
Dixon's Everlasting..10-lb pails, ea. 85¢
Dixon's Everlasting, in boxes, ℔ doz. 1 lb, $1.20; 2 lb, $2.00

Grips, Nipple—

Perfect Nipple Grips.....40&10&2%

Griddles, Soapstone—

Pike Mfg. Co.....33⅓@33⅓&10%

Grindstones—

Bicycle Emery Grinder.....$6.50
Bicycle Grindstones, each.....$2.50@3.00
Pike Mfg. Co.:
Improved Family Grindstones, per inch, ℔ doz.....$2.00
Pike Mower and Tool Grinder, each.....$6.00
} 33⅓%
Velox Bar Bearing, Mounted, Angle Iron Frames, each.....$3.25

Halters and Ties—

Covert Mfg. Co.:
Web.....45%
Jute Rope.....50&5%
Sisal Rope.....35&5%
Cotton Rope.....45&2%
Hemp Rope.....45&2%
Covert's Saddlery Works:
Web and Leather Halters.....70%
Jute and Manila Rope Halters....70%
Sisal Rope Halters.....60&20%
Jute, Manila and Cotton Rope Ties.70%
Sisal Rope Ties.....60&10%

Hammers—

Handled Hammers—

Heller's Machinists'...40&10@40&10&10%
Heller's Farriers.....40&10@40&10&10%
Magnetic Tack, Nos. 1, 2, 3, $1.25, $1.50, $1.75.....50%
Peck, Stow & Wilcox.....40&10&5%
Fayette R. Plumb:
Plumb, A. E. Nail.....
33⅓&7½@33⅓&10&7½%
Engineers' and B. S. Hand.....
50&7½&5@50&10&7½&5%
Machinists' Hammers.50&5@50&10&5%
Riveting and Tinners'.....
40&2½@40&10&2½%
Sargent's C. S. New List.....40%

Heavy Hammers and Sledges—

Under 3 lb., per lb. 50¢.....
80&10&10@85%
3 to 5 lb., per lb. 40¢.....
80&10&10@85%
Over 5 lb., per lb 30¢..85@85&10%
Wilkinson's Smiths'...lb. 9½@10¢

Handles—

Agricultural Tool Handles

Axe, Pick, &c....60&5@60&10&5%
Hoe, Rake, &c.....45@50&5%
Fork, Shovel, Spade, &c.:
Long Handles.....45@50&5%
D Handles.....40%

Cross-Cut Saw Handles—

Atkins'.....40&5%
Champion.....45@45&10%
Disston's.....50%

Mechanics' Tool Handles—

Auger, assorted...*gro. $2.50@$2.85*
Brad Awl.....*gro. $1.65@$1.85*
Chisel Handles:
Apple Tanged Firmer, gro. assorted.....*$2.40@$2.65*
Hickory Tanged Firmer, gro. assorted.....*$2.15@$2.40*
Apple Socket Firmer, gro. assorted.....*$1.75@$1.95*
Hickory Socket Firmer, gro. assorted.....*$1.45@$1.60*
Hickory Socket Framing, gro. assorted.....*$1.60@$1.75*
File, assorted.....gro. *$1.30@$1.40*
Hammer, Hatchet, Axe, &c.
60&10@60&10&10%
Hand Saw, Varnished, doz. 80&85¢; Not Varnished...*65@75¢*
Plane Handles:
Jack, doz. 30¢; Jack, Bolted.75¢
Fore, doz. 45¢; Fore, Bolted.90¢
Chapin-Stephens Co.:
Carving Tool.....40@40&10%
Chisel.....65@65&10%
File and Awl.....65@65&10%
Saw and Plane.....40@40&10%
Screw Driver.....40@40&10%
Millers Falls Adj. and Ratchet Auger Handles.....15&10%
Nicholson Simplicity File Handle....
℔ gro. $0.85@$1.50

Hangers—

NOTE.—Barn Door Hangers are generally quoted per pair, without track, and Parlor Door Hangers per double set with track, &c.

Barn Door, New Pattern, Round Groove, Regular:

Inch	*3*	*4*	*5*	*6*	*8*
Single Doz.	*$0.90*	*1.25*	*1.60*	*1.95*	*2.50*

Barn Door, New England Pattern, Check Back, Regular:

Inch	*3*	*4*	*5*	*6*
Single Doz.	*$1.30*	*1.85*	*2.50*	*3.00*

Allith Mfg. Co.:
Reliable, No. 1.....per doz. $8.00
Reliable, No. 2.....per doz. $9.60
Chicago Spring Butt Co.:
Friction.....25%
Oscillating.....25%
Big Twin.....25%
Chisholm & Moore Mfg. Co.:
Baggage Car Door.....50%
Elevator.....30%
Railroad.....50%
Cronk & Carrier Mfg. Co.:
Loose Axle.....60&10&5%
Roller Bearing.....75&5%
Griffin Mfg. Co.:
Solid Axle, No. 10, $12.00.....70%
Roller Bearing, No. 11, $15.00.70%
Roller Bearing, Ex. Hy., No. 22, $18.00.....70%
Hinged Hangers, $16.00....60&10%
Lane Bros. Co.:
Parlor, Ball Bearing.....$4.00
Parlor, Standard.....$3.15
Parlor, No. 105.....$2.85
Parlor, New Model.....$2.80
Parlor, New Champion.....$2.25
Barn Door, Standard.60&10&2½%
Hinged.....net $6.40
Covered.....60&10%
Special.....70&5%
Lawrence Bros.:
Advance.....60&10%
Cleveland.....70&5%
Clipper, No. 75.....60%
Crown.....60&10%
Easy Parlor Door, Dbl. Sets, $2.50; Single Sets, $1.25.
Giant.....60&5%
Hummer.....70&5%
New York.....60&10%
Peerless.....70&5%
Sterling.....60&10%
McKinney Mfg. Co.:
No. 1, Special, $15.....60&10%
No. 2, Standard, $18.....60&10%
Hinged Hangers, $16.....50%
Meyers' Stayon Hangers.....60%
Richards Mfg. Co.:
Pioneer Wood Track No. 3..$2.15
Ball B'r'g St'l Track No. 10.$2.40
Roller B'r'g St'l Track No. 12.$2.30
Ball B'r'g St'l Track No. 13.$2.40
Roller B'r'g St'l Track No. 14.$2.30
Hero, Adj. Track No. 19.....50%
Adjustable Track Tandem Trolley Track No. 16.....50%
Seal, Steel Track No. 8.....$2.40
Auto Adj. Track No. 22..40&10%
Trolley B. D. No. 17.....$1.40
Trolley F. D. No. 120.....$2.35
Trolley F. D. No. 121.....$2.45
Trolley F. D. No. 150.....$2.60
Safety Underwriters F. D. No. 101.....50%
Tandem No. 44.....70&5%
Trolley F. D. No. 151.....$3.00
Palace, Adjustable Track No. 132.....40&10%
Royal, Adjustable Track No. 122.....40&10%
Ives' Wood Track No. 1.....$2.15
Trolley B. D. No. 20.....$1.35
Trolley B. D. No. 24.....$1.45
Trolley B. D. No. 27.....$1.50
Trolley B. D. No. 28.....$1.66
Roller Bearings Nos. 39, 40, 41, 43, 44.....70&5%
Anti-friction No. 42.....60&10%
Hinged Tandem No. 48.....60%
Folding Door B. B. Swivel No. 135.....30%
Safety Door Hanger Co.:
Storm King Safety.....60%
U. S. Standard Hinge.....60%
Stowell Mfg. & Foundry Co.:
Acme Parlor Ball Bearing....40%
Ajax Hinge Door.....60%
Apex Parlor Door.....50&10&5%
Atlas.....60%
Baggage Car Door.....50%
Climax Anti-Friction.....50&10%
Elevator.....40%
Express.....50%
Freight Car Door.....60%
Interstate.....60&10%
Lundy Parlor Door.....50&10%
Magic.....60%
Matchless.....60&10%
Nansen.....70&5%
Parlor Door.....50&10%
Railroad.....50&10%
Rex Hinge Door.....60%
Street Car Door.....50%
Steel, Nos. 300, 404, 500...50&10%
Underwriters' Fire Door.....40%
Wild West Warehouse Door..50%
Zenith for Wood Track...50&10%
A. L. Sweet Iron Works:
Check Back.....70%
Climax Anti-Friction.....50&10%
Eagle.....70%
Hylo Hinge.....60%
New Perfection.....60%
Pilot.....60%
Pilot Hinge.....60%
Rider Wooster.....65%
Western Pattern.....70%
Taylor & Boggis F'y Co.'s Kidder's Roller Bearing.50&15&10&5%
Wilcox Mfg. Co.:
Bike Roller Bearing.....60&10%
C. J. Roller Bearing.....60&10%
Cycle Ball Bearing.....50%
Dwarf Ball Bearing.....40%
Ives, Wood Track.....60&10%
L. T. Roller Bearing...60&10&5%
New Era Roller Bearing..50&10%
O. K. Roller Bearing..60&10&5%
Prindle, Wood Track.....60%
Richards' Wood Track.....60%
Richards' Steel Track.....50&10%
Spencer Roller Bearing....60&10%
Tandem, Nos. 1 and 2.....60%
Underwriters' Roller Bearing..40%
Velvet.....50%
Wilcox Auditorium Ball B'r'g.20%
Wilcox Barn Trolley No. 125..40%
Wilcox Elv. Door, Nos. 112 and 122½.....50%
Wilcox Elv. Door, No. 132....40%
Wilcox Fire Trolley, Roller Bearing.....30%
Wilcox Le Roy Noiseless Ball Bearing.....40%
Wilcox New Century..50&10&10%
Wilcox O. K. Steel Track....50%
Wilcox O. K. Trolley.....50%
Wilcox Trolley Ball Bearing..40%
Wilcox Wideman Narrow Gauge, Ball Bearing.....40%
For Track, see Rail.

Extra 5@10% often given.

Hangers— Garment—

Pullman Trouser, No. 1....℔ gro. $9.00
Pullman Trouser, No. 4....℔ gro. $24.00
Victor Folding.....℔ gro. $9.60
Western, W. G. Co.....70&10%

Gate—

Myers' Patent Gate Hangers, ℔ doz. net.....$4.50

Hasps—

McKinney's Perfect Hasp, ℔ doz..50%

Hatchets—

Regular list, first quality.40&7½%
Second quality $1.00 per doz. less than first quality.

Heaters, Carriage—

Clark, No. 5, $1.75; No. 5B, $2.00; No. 3, $2.25; No. 3D, $2.75; No. 7D, $3.00; No. 3E, $3.25; No. 1, $3.50.....15%
Clark Coal, ℔ doz. $0.75.....10%

Hinges—

Blind and Shutter Hinges—

Surface Gravity Locking Blind: (Victor; National; 1868 O. P.; Niagara; Clark's O. P.; Clark's Tip; Buffalo.)

No.	*1*	*3*	*5*
Doz. pair	*$0.75*	*1.35*	*2.70*

Mortise Shutter: (L. & P., O. S., Dixie, &c.)

No.	*1*	*1½*	*2*	*2½*
Doz. pair	*$0.70*	*.65*	*.60*	*.55*

Mortise Reversible Shutter (Buffalo, &c.):

No.	*1*	*1½*	*2*
Doz. pair	*$0.70*	*.65*	*.60*

North's Automatic Blind Fixtures, No. 2, for Wood, $9.00; No. 3, for Brick, $11.50.....10%
Parker.....70&7½%
Reading's Gravity.....60%
Sargent's, Nos. 1, 3, 5, 11 and 13..75%
Stanley's Steel Gravity Blind Hinges, ℔ doz. sets, without screws, $0.90; with screws, $1.20.
Wrightsville Hardware Co.:
O. S., Lull & Porter.....75&10&5
Acme, Lull & Porter.....75&10
Queen City Reversible.....75&10
Shepard's Noiseless, Nos. 60, 65, 55.....75&10
Niagara, Gravity Locking, Nos. 1, 3 & 5.....75&10&5
1868, Old Pat'n, Nos. 1, 3 & 5....75&10&5
Tip Pat'n, Nos. 1, 3 & 5...75&10&5
Buffalo Gravity Locking, Nos. 1, 3 & 5.....75&10&5
Shepard's Double Locking, Nos. 20 & 25.....70%
Champion Gravity Locking, No. 75.75%
Steamboat Gravity Locking, No. 10.75%
Pioneer, Nos. 060, 45 & 5½.....75%
Empire, Nos. 101 & 103.....70%
W. H. Co.'s Mortise Gravity Locking, No. 2.....60%

Gate Hinges—

Clark's or Shepard's—Doz. sets:

No.	*1*	*2*	*3*
Hinges with L't'ch.	*$2.00*	*2.70*	*5.00*
Hinges only	*1.40*	*2.05*	*3.80*
Latches only	*.70*	*.70*	*.35*

New England:
With Latch.....*doz.* ....*@$2.60*
Without Latch...*doz.* ....*@$1.60*
Reversible Self-Closing:
With Latch.....*doz.* ....*@$1.75*
Without Latch...*doz.* ....*@$1.35*
Western:
With Latch.....*doz. $1.75*
Without Latch.....*doz. $1.15*
Wrightsville Hardware Co.:
Shepard's or Clark's, doz. sets,

Nos.	1	2	3
Hinges with Latches.	$2.00	2.70	5.00
Hinges only.	1.40	2.05	3.80
Latches only.	.70	.70	1.35

Pivot Hinges—

Bommer Bros. Pivot.....40%
Lawson Mfg. Co. Matchless.....45%

Spring Hinges—

Holdback Cast Iron.....
gro. $9.00@$9.50
Non-Holdback, Cast Iron.....
gro. $8.00@$8.50

J. Bardsley:
Bardsley's Non-Checking Mortise Floor Hinges.....45%
Bardsley's Patent Checking..15%
Bommer Bros.:
Bommer Ball Bearing Floor Hinges.....40%
Bommer Spring Hinges.....40%
Chicago Spring Butt Co.:
Chicago Spring Hinges.....25%
Triple End Spring Hinges....50%
Chicago (Ball Bearing) Floor Hinge.....50%
Garden City Engine House....25%
Keene's Saloon Door.....25%
Columbian Hardware Co.:
Acme, Wrought Steel.....30%
Acme, Brass.....25%
American.....30%
Columbia, No. 14.....℔ gr. $9.00
Columbia, No. 18.....℔ gr. $25.00
Columbia, Adjustable, No. 7.
℔ gr. $12.00
Gem, new list.....30%
Clover Leaf.....℔ gr. $12.50
Oxford, new list.....30%
Lawson Mfg. Co. Matchless....30%
Richards Mfg. Co.:
Superior Double Acting Floor Hinges.....40%
Shelby Spring Hinge Co.:
Buckeye All Steel Holdback Screen Door.....$9.00
Chief Ball B'r'g Floor Hinge.50%
Ohio Detachable Screen Door Hinge.....℔ gr. $12.00
The Stover Mfg. Co.:
Ideal, No. 16, Detachable, ℔ gr. $12.50
Ideal, No. 4.....℔ gr. $9.00
New Idea No. 1.....℔ gr. $9.00
New Idea, Double Acting....45%
New Idea Floor.....45%
Van Wagoner:
Ball Bearing.....25%
No. 777 Sh't Steel Holdb'k.℔ gro. pr $9.

Extra 5@10% often given on most of these Hinges.

Wrought Iron Hinges—

Strap and T Hinges, etc., list December 20, 1904:

Light Strap Hinges...
H'vy Strap H'g's...
Light T Hinges...
Heavy T Hinges...
Extra H'y T H'g's...
Hinge Hasps...
Cor. Heavy Strap...
Cor. Ex. Heavy T...
} *Extra 10@10&5%*

Screw Hook and Strap. { *6 to 12 in.* ..lb. 3½¢ ; *1½ to 20 in.* ..lb. 3½¢ ; *22 to 36 in.* ..lb. 3 ¢

Screw Hook and Eye:
⅜ to 1 inch.....lb. 6 ¢
⅝ inch.....lb. 7 ¢
½ inch.....lb. 9 ¢

Hitchers, Stall—

Covert Mfg. Co., Stall Hitchers....35%

Hods— Coal—

Per doz.

Inch	*15*	*16*	*17*	*18*
Galv. Open	*$2.50*	*2.75*	*3.00*	*3.25*
Jap. Open	*$1.90*	*2.10*	*2.25*	*2.55*
Galv. Funnel	*$3.00*	*3.30*	*3.60*	*3.90*
Jap. Funnel	*$2.45*	*2.65*	*2.85*	*3.30*

Masons, Etc.—

Cleveland Wire Spring Co.:
Steel Mortar.....each $1.45
Steel Brick.....each $1.10

Hoes— Eye—

Scovil and Oval Pattern.....
60&10@60&10&10%
Grub, list Feb. 23, 1899.....
70&10@75&10%
D. & H. Scovil.....35%

Handled—

NOTE.—Manufacturers are selling from the list of September 1, 1905, but many jobbers are still using list of August 1, 1899, or selling at net prices.

Ft. Madison Cotton Hoe....70&10&10%
Ft. Madison Crescent Cultivator Hoe, ℔ doz.....70&10%
Ft. Madison Mattock Hoes:
Regular Weight.....℔ doz. 66⅔%
Junior Size.....℔ doz. $4.00
Ft. Madison Sprouting Hoe..℔ doz. 50%
Ft. Madison Dixie Tobacco Hoe.....75&10&7½%
Kretsinger's Cut Easy.....70&10%
Warren Hoe.....45&10%
W. & C. Ivanhoe.....75&2
R. R. 6 in., Cultivator Hoe.....$3.15
R. R., 6½ in.....$3.35
Acme Wedding.....℔ doz., net, $4.35
W. & C. L'tning Shuffle Hoe, ℔ doz.$4.85

Hoisting Apparatus—

See *Machines, Hoisting.*

Holders— Bit—

Angular, ℔ doz. $24.00.....45&10%

Door—

Empire.....50%
Bardsley's.....45%

File and Tool—

Nicholson File Holders and File Handles.....33⅓@40%

Fruit Jar—

Triumph Fruit Jar Holder, ℔ gross, $2.50; ℔ doz.....$1.25

Hooks—Cast Iron—

Bird Cage, Reading.....60%
Bird Cage, Sargent's List.....60&10%
Ceiling, Sargent's List.....50&10&10%
Clothes Line, Reading List.....60&10%
Clothes Line, Sargent's List.50&20&10%
Coat and Hat, Sargent's List...50&10%
Clothes Line, Stowell's.....70%
Coat and Hat, Reading.....45&20%
Coat and Hat, Stowell's.....70%
Coat and Hat, Wrightsville.....65%
Harness, Reading List.....66⅔%
Harness, Stowell's.....60%
School House, Stowell's.....70%

Wire—

Belt.....*80&10@..%*
Wire C. & H. Hooks:.....
75&10@75&10&5%
Atlas, Coat and Hat:
Single Cases.....75%
10 Case Lots.....75&10%
Columbian Hdw. Co., Gem.....60&10%
Parker Wire Goods Co., King..75&10%
Van Wagoner, Coat and Hat.....70%
Western W. G. Co. Molding.....75%
Wire Goods Co.:
Acme.....60&10%
Chief.....70%
Crown.....70&10%
Czar.....65%
V Brace.....70&10%
Czar Harness.....50&10%

Wrought Iron—

Bar, 6 in., per doz., $1.00; 8 in., $1.25; 10 in., $2.50.
Cotton.....*doz. $1.05@$1.25*
Wrought Staples, Hooks, &c.—
See Wrought Goods.

Miscellaneous—

Hooks, Bench, see *Stops, Bench.*
Rush, Light, doz. $4.75; Medium, $5.35; Heavy, $6.25.
Grass, best, all sizes, per doz.$1.50
Grass, common grades, all sizes, per doz.....*$1.30*
Whiffletree.....*lb. 5¾@6¢*
Hooks and Eyes:
Brass.....*60&10&5@60&10&10%*
Malleable Iron..70&10@70&10&10%
Covert Mfg. Co. Gate and Scuttle Hooks.....35%
Covert Saddlery Works' Self Locking Gate and Door Hook.....60%
Ft. Madison Cut-Easy Corn Hooks, ℔ doz. $3.25 net
Bench Hooks—See Bench Stops.
Corn Hooks—See Knives, Corn.

Horse Nails—

See *Nails, Horse.*

Horseshoes—

See *Shoes, Horse.*

Hose, Rubber—

Garden Hose, ¾-inch:
Competition.....*ft. 5 @ 6 ¢*
3-ply Standard.....*ft. 8 @ 9 ¢*
4-ply Standard.....*ft. 10 @11 ¢*
3-ply extra.....*ft. 11 @13 ¢*
4-ply extra.....*ft. 14 @16 ¢*
Cotton Garden, ¾-in., coupled:
Low Grade.....*ft. 8 @ 9 ¢*
Fair Quality.....*ft. 10 @11 ¢*

Irons— Sad—

From 4 to 10.....*lb. 2¾@3 ¢*
B. B. Sad Irons.....*lb. 3½@3½¢*
Chinese Laundry.....*lb. 4¾@5 ¢*
Chinese Sad.....*lb. 4 @4¼¢*
Mrs. Potts', cents per set:

Nos.	*50*	*55*	*60*	*65*
Jap'd Tops	*62*	*59*	*72*	*69*
Tin'd Tops	*65*	*62*	*75*	*72*

New England Pressing..lb. 3¾@4¼¢

Pinking—

Pinking Irons.....*doz. 50@80¢*

Soldering—

Soldering Coppers, 2½ & 3..20@21¢
1½ & 2.....*22@23¢*

Jacks, Wagon—

Covert Mfg. Co.:
Auto Screw.....30&5%
Steel.....45&2%
Covert's Saddlery Works:
Daisy.....60&10%
Victor.....60%
Lockport.....50%
Lane's Steel.....30&10&5%
Richards' Tiger Steel, No. 130.....40%

Kettles—

Brass, Spun, Plain.....*20@25%*
Enameled and Cast Iron—See Ware, Hollow.

Knives—

Butcher, Kitchen, &c.—

Foster Bros.' Butcher, &c.....30%
Smith & Hemenway Co.....40&10%
Wilkinson Shear & Cutlery Co.....50%

Corn—

Withington Acme, ℔ doz., $2.65; Dent, $2.75; Adj. Serrated, $2.20; Serrated, $2.10; Yankee No. 1, $1.50; Yankee No. 2, $1.15.

Drawing—

Standard List.....*70&10@75&10%*
C. E. Jennings & Co., Nos. 45, 46..60%
Jennings & Griffin, Nos. 41, 42.....60%
Ohio Tool Co.'s.....70%
Swan's.....70&10&2½%
Watrous.....16⅔%
L. & I. J. White.....20&5@25%

Hay and Straw—

Serrated Edge..per doz.$5.25@5.50
Iwan's Sickle Edge.....℔ doz. $9.50
Iwan's Serrated.....℔ doz. $10.00

Mincing—

Buffalo.....℔ gro. $13.00

Miscellaneous—

Farriers'.....*doz. $3.00@3.25*
Wostenholm's.....℔ doz. $3.00@3.25

Knobs—

Base, 2½-inch, Birch, or Maple, Rubber tip.....*gro.$1.15@1.20*
Carriage, Jap., all sizes.....
gro. 40@45¢
Door, Mineral.....*doz. 65@70¢*
Door, Por. Jap'd.....*doz. 70@75¢*
Door, Por. Nickel..doz. $2.05@2.15
Bardsley's Wood Door, Shutters, &c.15%
Picture, Sargent's.....60&10&10%

Lacing, Leather—

See *Belting, Leather—*

Ladders, Store, &c.—

Lane's Store.....25%
Myers' Noiseless Store Ladders....50%
Richards Mfg. Co.:
Improved Noiseless, No. 112.....40%
Climax Shelf, No. 113.....40%
Trolley, No. 109.....40%

Ladles, Melting—

L. & G. Mfg. Co. (low list).....25%
P. S. & W.....50%
Reading.....60%
Sargent's.....50&10%

Lanterns—Tubular—

Regular Tubular, No. 0.....
doz. $4.25@4.85
Lift Tubular, No. 0.....
doz. $4.50@5.15
Hinge Tubular, No. 0.....
doz. $4.50@5.15
Other Styles.....*40¢&10@40&10&5%*

Bull's Eye Police—

No. 1, 2¾-inch.....*$2.50@2.75*
No. 2, 3-inch.....*$2.75@3.00*

Lasts and Stands, Shoe—

Stowell's Atlas, Malleable Iron.....50%
Stowell's Badger, Cast Iron.....50%

Latches— Thumb—

Roggin's Latches, with screw..
doz. 35@40¢

Door—

Richards' Bull Dog, Heavy, No. 125.40%
Richards' Trump, No. 127.....50%

Leaders, Cattle—

Small.....*doz. 50¢; large, 60¢*
Covert Mfg. Co.....35%

Lifters, Transom—

R. & E.....33⅓%

Lines—

Wire Clothes, Nos.	*18*	*19*	*20*
100 feet	*$2.20*	*2.00*	*1.65*
75 feet	*$1.80*	*1.70*	*1.30*

Samson Cordage Works:
Solid Braided Chalk, Nos. 0 to 3..40%
Silver Lake Braided Chalk, No. 0, $6.00; No. 1, $6.50; No. 2, $7.00; No. 3, $7.50.....℔ gr. 20%
Masons' Lines, Shade Cord, &c.:
White Cotton, No. 3½, $1.50; No. 4, $2.00; No. 4½, $2.50; Colors, No. 3½, $1.75; No. 4, $2.25; No. 4½, $2.75; Linen, No. 1½, $2.50; No. 4, $3.50; No. 4½, $4.50.....20%
Tent and Awning Lines: No. 5, White Cotton, $7.50; Drab Cotton, $8.50.....20%
Clothes Lines, White Cotton: 50 ft., $2.75; 60 ft., $3.25; 70 ft., $3.75; 75 ft., $4.00; 80 ft., $4.25; 90 ft., $4.75; 100 ft., $5.25.....20%
Anniston Waterproof Clothes, 50 ft., ℔ gro., $24.00; Gilt Edge, $22.00; Air Line, $22.00; Acme, $17.00; Alabama, $15.00; Empire, $14.00; Advance, $13.50; Oriole, $20.00; Albemarle, $13.50; Eclipse, $12.50; Chicago, $11.00; Standard, $10.00; Columbia, $8.50; Allston, $12.50; Calhoun, $11.00.

Locks— Cabinet—

Cabinet Locks..*33⅓@33⅓&7½%*

Door Locks, Latches, &c.—

NOTE.—Net Prices are very often made on these goods.
Reading Hardware Co.....45&20%
R. & E. Mfg. Co.....40%
Sargent & Co.....40&10%
Stowell's Steel Door Latches.....50%

Elevator—

Stowell's.....80%

Padlocks—

Wrought Iron....*75&10&5@80&8%*
R. & E. Mfg. Co. Wrought Steel and Brass.....75@75&10%

Sash, &c.—

Ives' Patent:
Bronze and Brass.....62½%
Crescent.....50&10%
Iron.....62½%
Window Ventilating.....60%
Robinson Patent Ventilating Sash Lock.....40%
Wrought Bronze and Brass.....55%
Wrought Steel.....55%
Pullman Patent Ventilating Lock..25%
Reading.....60%

Machines—Boring—

Com. Upr't, without Augers.$2.00
Com. Ang'l'r, without Augers.$2.25
Without Augers.

R. & E. Mfg. Co.:	Upright.	Angular.
Improved No. 3..	$4.25	No. 1..$5.00
Improved No. 4..	3.75	No. 2.. 3.38
Improved No. 5..	2.75	
Jennings', Nos. 1 and 4		35&5%
Millers' Falls		5.75
Snell's, Rice's Pat.	2.50	2.75

Corking—

Reisinger Invincible Hand Power....
℔ doz. $48.00

Fence—

Williams' Fence Machines....each, $5.50

Hoisting—

Moore's Anti-Friction Differential Pulley Block.....30%
Moore's Hand Hoist, with Lock Brake.....20%

Ice Cutting—

Chandler's.....12½%

Washing—

Boss Washing Machine Co.: Per doz.
Champion Rotary Banner No. 1..$54.00
Standard Champion No. 1.....$48.00
Standard Perfection.....$26.00
Cinti Square Western.....$30.00
Uneeda American, Round.....$29.00

Mallets—

Hickory.....*45&5&10%*
Lignumvitæ.....*45&5&10%*
Tinners' Hickory and Apple-wood.....*doz. 45&5&10%*

Mangers, Stable—

Swett Iron Works.....50%

Mashers, Vegetable—

Western, W. G. Co., Potato....60&10%

Mats, Door—

Elastic Steel (W. G. Co.).....10%

Mattocks—

See *Picks and Mattocks.*

Milk Cans—See *Cans, Milk.*

Mills, Coffee, &c.—

Enterprise Mfg. Co.....25@30%
National list Jan. 1, 1902.....30%
Parker's Columbia & Victoria..50&10@6%
Parker's Box and Side.....50&10@60%
Swift, Lane Bros. Co.....30%

Mowers, Lawn—

NOTE.—Net prices are generally quoted
Cheap.....*all sizes, $1.75@2.00*
Good.....*all sizes, $2.25@2.50*

	10	*12*	*14*	*16* in.
High Grade	*4.25*	*4.50*	*4.75*	*5.00*
Continental				60&5%
Great American				70%
Great American Ball B'r, new list				70%
Quaker City				70%
Pennsylvania				60&5%
Pennsylvania, Jr., Ball Bearing				60%
Pennsylvania Golf				50%
Pennsylvania Horse				33⅓&5%
Pennsylvania Pony				40&5%
Philadelphia:				
Styles M., S., C., K., T				70&5%
Style A, all Steel				60&5%
Style E, High Wheel				70&10&5%
Drexel and Gold Coin, special list				50%

Nails—

Wire Nails and Brads, Papered, List July 20, 1899..85&10&10@10&90%
Cut and Wire. See *Trade Report.*
Hungarian, Finishing, Upholsterers' &c. See *Tacks.*

Horse—

Nos.	6	7	8	9	10	
Anchor	23	21	20	19	18	...40&5%
Champlain	28	26	25	24	23	.....50%
Coleman	13	12	12	11	11	.....net
New Haven	23	21	20	19	18	....40&5%
Putnam	23	21	20	19	18	....33⅓%
New Putnam	19	18	17	16	16	...10&10%
Western						℔ lb 8½¢

Jobbers' Special Brands.....
per lb. 8½@10¢

Picture—

	1½	*2*	*2½*	*3*	*3½ in.*
Brass H'd	*.45*	*.55*	*.60*	*.70*	*.. gro*
Por. Head	*..1.10*	*1.10*	*1.10*		*.. gro*

Nippers—

See *Pliers and Nippers.*

Nuts—

Cold Punched: Off list.
Mfrs. or U. S. Standard.
Square, plain.....*$4.90*
Hexagon, plain.....*$5.10*
Square, C. T. & R.....*$5.10*
Hexagon, C. T. & R.....*$5.80*
Hot Pressed:
Mfrs., U. S. or Nar. Gauge Stan'd.
Square, Blank.....*$5.50*
Hexagon, Blank.....*$5.80*
Square, Tapped.....*$5.50*
Hexagon, Tapped.....*$5.80*

Oakum—

Best or Government.....*lb. 6½¢*
Navy.....*lb. 5 ¢*
U. S. Navy.....*lb. 6 ¢*
Plumbers' Spun Oakum.....*2½¢*
In carload lots ¼¢ lb. off, f.o.b. New York.

Oil Tanks—See *Tanks, Oil.*

Oilers—

Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Chase or Paragon:
Brass and Copper.....*50&10%*
Tin or Steel.....*65&10%*
Zinc.....*65&10%*
Malleable, Hammers' Imp'ed, No. 1, $3.60; No. 2, $4; No. 3, $4.40. ℔ doz. 20%
Malleable, Hammers' Old Pattern, same list.....50&10%
American Tube & Stamping Co.:
Spring Bottom Cans.....70@70&10%
Railroad Oilers, &c.....60@60&10%

Openers— Can—

Per doz.
Sprague, Iron Handle....*30@35¢*
Sprague, Wood Handle...*35@40¢*
Sardine Scissors.....*$1.75@$3.00*
National.....50%
Stowell's Sprague.....℔ doz. 35@45¢

Egg—

Nickel Plate.....℔ doz., $2.00
Silver Plate.....℔ doz., $4.00

Packing—

Asbestos Packing, Wick and Rope.....*lb. 14@16¢*

Rubber—

(Fair quality goods.)
Sheet, C. I.....*86@10¢*
Sheet, C. O. S.....*90@13¢*
Sheet, C. B. S.....*100@14¢*
Sheet, Pure Gum.....*50@65¢*
Sheet, Red.....*40@50¢*
Jenkins' '96, ℔ lb 80¢.....25@25&5%

Miscellaneous—

American Packing...*lb. 7@10 ¢*
Cotton Packing.....*lb. 16@25 ¢*
Italian Packing.....*lb. 9@12½¢*
Jute.....*lb. 4@ 4½¢*
Russia Packing.....*lb. 8@11 ¢*

Pails, Creamery—

S. S. & Co., with gauges—No. 1, $6.25; No. 2, $6.50 ℔ doz.

Pails, Water, Well, &c.—

See *Buckets.*

Pans— Dripping—

Standard List.60&10@60&10&12½%

Fry—

Common Lipped:

Nos.	*1*	*2*	*3*	*4*	*5*
Per doz.	*$0.75*	*0.80*	*0.90*	*1.10*	*1.30*

Refrigerator, Galva.—

Inch	*12*	*14*	*16*	*18*
Per doz	*$1.95*	*2.25*	*2.80*	*3.15*

Roasting and Baking—

Regal, S., S. & Co., ℔ doz., Nos. 5, $4.50; 10, $5.25; 20, $5.75; 30, $6.25.
Savory, ℔ doz., net, Nos. 200, $9.00; 400, $15.00.
Simplex, ℔ gro.:

No.	40	50	60	140	150	160
	$30.00	35.00	42.00	34.00	39.00	46.00

Paper—Building Paper

Asbestos:	*lb.*
Building Felt	*2¾¢*
Mill Board, sheet, 40@40 in.	*3½¢*
Mill Board, roll, thicker than 1-16 inch	*3½¢*
Mill Board, 1-16 inch thick and less	*2½¢*
	Per roll
Rosin Sized Sheathing: 500 sq. ft. Light weight, 25 lbs. to roll	*35@40¢*
Medium weight, 30 lbs. to roll,	*40@45¢*
Heavy weight, 40 lbs. to roll..	*56@60¢*

Black Water Proof Sheathing, 500 sq. ft., 1 ply, 65¢; 2 ply, 85¢; 3 ply, $1.10; 4 ply, $1.25.
Deafening Felt, 9, 6 and 4½ sq. ft. to lb. ton.....*$38.00@40.00*
Red Rope Roofing, 250 sq. ft. per roll.....*$1.75*

Tarred Paper—

1 ply (roll 300 sq. ft.), ton.... $32.50@35.50
2 ply, roll 108 sq. ft.....55@60¢
3 ply, roll 108 sq. ft.....78@85¢
Slater's Felt (roll 500 sq. ft.) .75¢
R. R. M. Stone Surfaced Roofing (roll 110 sq. ft.).....$2.75

Sand and Emery—

Flint Paper and Cloth .60@60&10%
Garnet Paper and Cloth....25%
Emery Paper and Cl'h .50&10@60%

Parers— Apple—

Advance .....℔ doz. $4.00
Baldwin .....℔ doz. $4.00
Bonanza Improved.....each $6.50
Daisy .....℔ doz. $4.00
Dandy .....each $7.50
Eureka Improved.....each $20.00
Family Bay State.....℔ doz. $15.00
Improved Bay State.....℔ doz. $36.00
Little Star.....℔ doz. $5.00
New Lightning.....℔ doz. $7.00
Reading 72.....℔ doz. $3.25
Reading 78.....℔ doz. $6.25
Rocking Table.....℔ doz. $6.20
Turn Table '98.....℔ doz. $6.00
White Mountain.....℔ doz. $5.00

Potato—

Saratoga .....℔ doz. $7.00
White Mountain.....℔ doz. $6.00

Picks and Mattocks—

List Feb. 23, 1899.....70&5@75%
Cronk's Handled Garden Mattock, ℔ doz., $6.40.....33⅓%

Pinking Irons—

See *Irons, Pinking.*

Pins, Escutcheon—

Brass .....60@60&10%
Iron, list Nov. 11, '85..60@60&10%

Pipe, Cast Iron Soil—

Carload lots.
Standard, 2-6 in.....60%
Extra Heavy, 2-6 in.....70%
Fittings 75%

Pipe, Merchant—

Carload Lots.

	Steel. Blk.	Galv.	Iron. Blk.	Galv.
⅛ & ¼ in.	68%	52%	66 & 5%	50 & 5%
⅜ & ½ in.	72%	60%	70 & 5%	58 & 5%
¾ to 6 in.	76%	66%	71½% & 6%	61½% & 5%
7 to 12 in.	71%	56%	69½% & 5%	54 & 5%

Pipe, Sewer—

Carload lots.
Standard Pipe and Fittings, 2 to 24 in.:
New England.....71%
New York and New Jersey.74%
Maryland, Delaware, E. Pa.78%
West. Pa. and West Va...80%
Virginia 76%
Ohio, Michigan and Ky....80%
Indiana 80%
NOTE.—Carload lots are generally delivered.

Pipe, Stove—

Edwards' Nested Stove Pipe:	C. L.	L. C. L.
5 in., per 100 joints	$7.00	$8.00
6 in., per 100 joints	7.50	8.50
7 in., per 100 joints	8.50	9.50

Planes and Plane Irons—

Wood Planes—

Bench, first qual.....40&10%
Bench, Second qual.....50&10%
Molding .....33⅓&10%
Bailey's (Stanley R. & L. Co.).....40%
Chapin-Stephens Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Toy and German.....40@40&10%
Chaplin's 60%
Ohio Tool Co.:
Bench, First Quality.....40@40&10%
Bench, Second Quality....50@50&10%
Molding .....33⅓@33⅓&10%
Adjustable Wood Bottom.....60%
Union 60%

Iron Planes—

Bailey's (Stanley R. & L. Co.).....40%
Chaplin's Iron Planes.....50&10%
Miscellaneous Planes (Stanley R. & L. Co.).....35%
Ohio Tool Co.'s Iron Planes.....60%
Sargent's .....60&10%
Union 60%

Plane Irons—

Wood Bench Plane Irons..... 25&10@30%
Buck Bros.....30%
Chapin-Stephens Co.....30@30&10%
Ohio Tool Co.....30%
Stanley R. & L. Co.....35%
Union 50%
L. & I. J. White.....20&5@25%

Planters, Corn, Hand—

Kohler's Eclipse.....℔ doz. $8.50

Plates—

Felloe .....lb. 3¾@4¼¢
Self-Sealing Pie Plates (S., S. & Co.), ℔ doz. $2.00.....50%

Pliers and Nippers—

Button Pliers.....75&10@80%
Gas Burner, per doz., 5 in., $1.25 @ $1.30; 6 in., $1.45 @ $1.50.

Gas Pipe..	7	8	10	12-in.
	$2.00	$2.25	$3.00	$3.75

Acme Nippers.....50@50&5%
Cronk & Carrier Mfg. Co.:
American Button.....75&10%
Cronk's 60%
Improved Button.....60&10%
Stub's Pattern.....50%
Combination and others.....33⅓%
Heller's Farriers' Nippers, Pincers and Tools.....40&10@40&10&10%
P., S. & W. Tinners' Cutting Nippers .....30@30&10%
Swedish Side, End and Diagonal Cutting Pliers.....50%
Utica Drop Forge & Tool Co.:
Pliers and Nippers, all kinds.....40%

Plumbs and Levels—

Chapin-Stephens Co.:
Plumbs and Levels.....30@30&10&10%
Chapin's Imp. Brass Cor.40@40&10&10%
Pocket Levels.....30@30&10&10%
Disston's Plumbs and Levels.....70%
Disston's Pocket Levels.....70%
C. E. Jennings & Co.'s Iron.....33⅓%
C. E. Jennings & Co.'s Iron, Adjustable .....40&7½%
Stanley R. & L. Co.....45%
Stanley's Duplex.....35%
Woods' Extension.....33⅓%

Poachers, Egg—

Buffalo Steam Egg Poachers, ℔ doz., No. 1, $6.00; No. 2, $9.00; No. 3, $9.00; No. 4, $12.00.....50%

Points, Glaziers'—

Bulk and 1-lb. papers, lb. 8½@9 ¢
½-lb. papers.....lb. 9 @9½¢
¼-lb. papers.....lb. 9¾@10¼¢

Pokes, Animal—

Ft. Madison Hawkeye.....℔ doz. $3.25
Ft. Madison Western.....℔ doz. $4.00

Police Goods—

Manufacturers' Lists...25@25&5%
Tower's 25%

Polish—Metal—

Prestoline Liquid, No. 1 (½ pt.), ℔ doz., $3.00; No. 2 (1 qu.), $9.72....40%
Prestoline Paste.....40&10%
George William Hoffman:
U. S. Metal Polish Paste, 3 oz. boxes, ℔ doz. 50¢; ℔ gro. $4.50; ½ lb boxes, ℔ doz. $1.25; 1 lb boxes, ℔ doz. $2.25.
U. S. Liquid, 8 oz. cans, ℔ doz., $1.25; ℔ gro., $12.00.
Barkeepers' Friend Metal Polish, ℔ doz., $1.75; ℔ gro., $18.00.
Wynn's White Silk, ½ pt. cans, ℔ doz. $2.00

Stove—

Black Eagle Benzine Paste, 5 lb cans, ℔ lb 10¢
Black Eagle, Liquid, ½ pt. cans, ℔ doz. 75¢
Black Jack Paste, ¾ lb cans, ℔ gr. $9.00
Black Kid Paste, 5 lb can....each, $0.65
Ladd's Black Beauty, gr. $10.00.....50%
Joseph Dixon's, ℔ gr. $5.75.....10%
Dixon's Plumbago.....℔ lb 8¢
Fireside .....℔ gr. $2.50
Gem, ℔ gr. $4.50.....10%
Japanese .....℔ gr. $3.50
Jet Black.....℔ gr. $3.50
Peerless Iron Enamel, 10 oz. cans.. ℔ doz. $1.50
Wynn's:
Black Silk, 5 lb pail.....each 70¢
Black Silk, ½ lb box.....℔ doz. $1.00
Black Silk, 5 oz. box.....℔ doz. $0.75
Black Silk, ½ pt. liq.....℔ doz. $1.00

Poppers, Corn—

1 qt., Square.....gro. $9.00
1 qt., Round.....gro. $10.00
1½ qt., Square.....gro. $11.00
2 qt., Square.....gro. $13.00

Post Hole and Tree Augers and Diggers—

See also *Diggers, Post Hole, &c.*

Posts, Steel—

Steel Fence Posts, each, 5 ft., 42¢; 6 ft., 46¢; 6½ ft., 48¢.
Steel Hitching Posts.....each $1.30

Potato Parers—

See *Parers, Potato.*

Pots, Glue—

Enameled 40%
Tinned 35%

Powder—

In Canisters:
Duck, 1 lb.....each 45¢
Fine Sporting, 1 lb....each 75¢
Rifle, ½-lb.....each 15¢
Rifle, 1-lb.....each 25¢
King's Semi-Smokeless:
Keg (25 lb bulk).....$6.50
Half Keg (12½ lb bulk).....$3.50
Quarter Keg (6¼ lb bulk).....$1.90
Case 24 (1 lb cans bulk).....$8.50
Half case (1 lb cans bulk).....$4.50

King's Smokeless:	Shot Gun.	Rifle.
Keg (25 lb bulk)	$12.00	$15.00
Half Keg (12½ lb bulk)	6.25	7.75
Quarter Keg (6¼ lb bulk)	3.25	4.00
Case 24 (1 lb cans bulk)	14.00	17.00
Half case 12 (1 lb c. bk)	7.25	8.75

Robin Hood Sm'less Shot Gun..50&20%

Presses—

Fruit and Jelly—

Enterprise Mfg. Co.....20@25%

Seal Presses—

Morrill's No. 1, ℔ doz., $20.00.....50%

Pruning Hooks and Shears

See *Shears.*

Pullers, Cork—

Invincible Cork Puller.....$21.00

Pullers, Nail—

Cyclops 50%
Miller's Falls, No. 3, ℔ doz., $12.00.. 33⅓&10%
Morrill's No. 1, Nail Puller, ℔ doz. $20.00 .....50%
Pearson No. 1, Cyclone Spike Puller, each $30.00.....50%
Pelican, ℔ doz. $9.00.....40&10%
Scranton, Case Lots:
No. 2B (large).....$5.50
No. 3B (small).....$5.00
Smith & Hemenway Co.:
Diamond B, No. 2, case lots..... ℔ doz. $6.00
Diamond B, No. 3, case lots..... ℔ doz. $5.50
Giant No. 1, ℔ doz. $18; No. 2, $16.50; No. 3, $15.....40%

Pulleys, Single Wheel—

	Inch	1½	1¾	2	3
Awning or Tackle, doz.		$0.30	.45	.60	1.05
Hay Fork, Swivel or Solid Eye. doz., ¼ in., $1.25; 5 in., $1.55					
	Inch	2	2¼	2½	
Hot House, doz.		$0.65	.85	1.20	
	Inch	1¼	1½	1¾	2
Screw, doz.		$0.16	.19	.23	.30
	Inch	1¾	2	2¼	2½
Side, doz.		$0.25	.40	.55	.60
	Inch	1½	1¾	2	2½

Stowell's:
Ceiling or End, Anti-Friction..60&10%
Dumb Waiter, Anti-Friction..60&10%
Electric Light.....60%
Side, Anti-Friction.....60&10%

Sash Pulleys—

Common Frame; Square or Round End, per doz, 1¾ and 2 in.....16@19¢
Auger Mortise, no Face Plate, per doz., 1¾ and 2 in..16@19¢
Acme.....1¾ in., 16¢; 2 in., 19¢
Fox-All-Steel, Nos. 3 and 1, 2 in..... ℔ doz. 50%
Grand Rapids All Steel Noiseless..50%
Ideal .....70&10%
Niagara.....1¾ in., 16¢; 2 in., 19¢
No. 26, Troy..1¾ in., 14½¢; 2 in., 16½¢
Star.....1¾ in., 16¢; 2 in., 19¢
Tackle Blocks—See Blocks.

Pumps—

Cistern .....60@60&10%
Pitcher Spout.....80@80&5%
Wood Pumps, Tubing, &c..45@50%
Barnes Dbl. Acting (low list).....50%
Barnes' Pitcher Spout.....75&10&5%
Contractors' Rubber Diaphragm No. 2, B. & L. Block Co.....$16.00
Daisy Spray Pump.....℔ doz. $7.20
Flint & Walling's, Fast Mail Hand, (low list).....55%
Flint & Walling's Fast Mail (low list).....55&5%
Flint & Walling's Tight Top Pitcher.80%
National Specialty Mfg. Co., Measuring, $6.00.....30%
Mechanical Sprayer.....$7.20
Myers' Pumps (low list).....50%
Myers' Power Pumps.....50%
Myers' Spray Pumps.....50%

Pump Leathers—

Plunger and Lower Valve—Per gro.:

Inch...	2	2¼	2½	2¾
	$2.20	2.50	2.75	3.00
Inch...	3	3¼	3½	3¾	4
	$3.30	3.60	3.85	4.10	4.40

Plunger Cup Leathers—Per 100:

Inch...	2½	3	3½	4
	$2.75	3.85	5.00	6.00

Punches—

Saddlers' or Drive, good..... doz. 50@75¢
Spring, single tube, good quality .....$1.75@2.00
Revolving (4 tubes)..... doz. $3.50@3.75
Bemis & Call Co.'s Cast St'l Drive.50%
Bemis & Call Co.'s Check.....55%
Morrill's No. 1 (A.B.C.), ℔ doz. $15.50
No. 2, ℔ doz. $22.50.....50%
Hercules, each $7.50.....50%
Niagara Hollow Punches.....40%
Niagara Solid Punches.....55&10%
Steel Screw, B. & K. Mfg. Co.....50%
Tinners' Hollow, P., S. & W. Co.35@35&5%
Tinners' Solid, P., S. & W. Co., ℔ doz., $1.44.....60%

Rail—Barn Door, &c.—

Cast Iron Barn Door; Flange Screw Holes for Rd. Groove Wheels:

½	⅝	¾ in.	
$2.50	$3.00	$3.40	*100 feet.*

Angular for Sq. Groove Wheels: Small. Med. Large.

$2.00	$2.70	$3.60	*100 feet.*

Sliding Door, Painted Iron.... 2¼@2¾ ¢
Sliding Door, Wrought Brass, 1¼ in., lb., 36¢.....30%
Allith Mfg. Co.:
No. 1, Reliable Hgr. Track, ℔ ft. 5½¢
No. 2, Reliable Hgr. Track, ℔ ft. 7¢
Cronk's:
Double Braced Steel Rail....℔ ft. 3¢
O. N. T. Rail.....2¾¢
Griffin's:
xxx, ℔ 100 ft., 1 x 3-16 in., $3.00; 1¼ x 3-16 in., 3.50.
Hinged Hanger, ℔ 100 ft., 1 x 3-16 in., $3.10; 1¼ x 3-16 in., $3.60.
Lane's:
Hinged Track, ℔ 100 ft., 1 in., $3.70; 1¼ in., $4.40.
O. N. T., ℔ 100 ft., 1 in., $2.75; 1¼ in., $3.50; 1½ in., $4.00.
Standard, 1¼ in.....℔ 100 ft. $4.00
Lawrence Bros.:
℔ 100 ft. No. 201, $4.00; No. 202, $4.40.
New York, 1 x 3-16 in., ℔ 100 ft. $2.75
McKinney's:
Hinged Hanger Rail, ℔ ft., 11¢ .50%
None Better.....℔ ft. 3¾¢
Standard .....℔ ft. 4 ¢
Myers' Stayon Track.....60%
Richards' Mfg. Co.:
Common 1 x 3-16 in., $2.75; 1¼ x 3-16, $3.25; 1¼ x 3-16, $3.50.
Special Hinged Hanger Rail.....$4.40
Fire Door Track, ℔ ft., 2½ x ⅜, 15¢; 3¼ x ⅜, 9¢.
Lag Screw Rail, No. 65.....40%
Gauge Trolley Track, ℔ ft., No. 31, 10¢; No. 32, 15¢; No. 33, 24¢.
Safety Door Hanger Co.'s Storm King Safety.....60%
Safety Door Hanger Co.'s U. S. Standard 60%
Stowell's:
Cast Rail.....℔ ft. 1¾¢
Steel Rail, Plain.....25%
Wrought Bracket, 1 3-16 in.....℔ ft. 3¢
Wrought Bracket, 1¼ x 5-16..℔ ft. 7¢
Swett's Hylo, ℔ ft. 11¢.....60%
P. L. B. Steel Rail.....℔ 100 ft. $3.00
No. 0, 1 x 3-16.....℔ 100 ft. $2.75

Rakes—

NOTE.—Manufacturers are selling from the list of September 1, 1904, but many jobbers are still using list of August 1, 1899, or selling at net prices.
Fort Madison Red Head Lawn....$3.25
Fort Madison Blue Head Lawn....$2.70
Jackson Lawn, 29 and 30 teeth, ℔ doz., net.....$4.25
Cronk's:
New Champion Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00..75%
Victor Garden, ℔ doz., 12 teeth, $15.00; 14, $16.50; 16, $18.00....75&25%
Queen City Lawn, ℔ doz., 20 teeth, $3.45; 24, $3.60.....
Anticlog Lawn, ℔ doz.....$4.00
Malleable Garden.....70&10%
Kohler's:
Lawn Queen, 20-tooth.....℔ doz. $3.45
Lawn Queen, 24-tooth.....℔ doz. $3.60
Paragon, 20-tooth.....℔ doz. $2.75
Paragon, 24-tooth.....℔ doz. $3.00
Steel Garden, 14-tooth....℔ doz. $2.88
Malleable Garden, 14-tooth, ℔ doz. $1.75@2.00
Weldless Steel Garden.....75&5%

Rasps, Horse—

Disston's 75%
Heller Bros.'.....70&5@70&10&5%
McCaffrey's American St'd...60&10&5%
New Nicholson.....70&10@75%
See also Files.

Razors—

Borasic 60%
Fox Razors, No. 42..℔ doz. $20.00 } 20 in Set
Fox Razors, No. 44..℔ doz. $20.00 }
Fox Razors, No. 52, Platina... ℔ doz. $25.00 }
Red Devil.....60%
Silberstein:
Carbo Magnet.....$18.00
Griffon, No. 65.....$15.00
Griffon, No. 00.....$12.00
All other Razors.....40%

Safety Razors—

Silberstein 40%

Reels, Fishing—

Hendryx:
M 6, Q 6, A 6, B 6, M 9¼, M 16, Q 16, A 16, B 16, 4008, Rubber, Populo, Nickeled Populo.....20%
Aluminum, German Silv., Bronze.25%
1240 N, 124 N.....20%
3004 N, 06 N, 6 RM, G 9.....25%
4 N, 6 PN, 24 N, 26 PN.....20%
2904 P.....33⅓%
2904 PN.....33⅓%
0924 N.....33⅓%
02084 N.....33⅓%
002904 PN.....33⅓%
802 N.....33⅓%
986 PN, 2904 N, 974 PN.....25%
5009 PN, 5009 N.....20%
Competitor, 102 P., 102 PN, 202 P., 202 PN, 102 PR, 202 PR.....20%
304 P, 304 PN, 00304 P, 00304 PN.33⅓%

Registers—*List July 1, 1903.*

Black Jap.....75%
Bronzed 75%

Revolvers—

Single Action.....95¢@$1.00
Double Action, except 44 cal.$1.85
Double Action, 44 caliber....$2.00
Automatic $3.45
Hammerless $4.00
NOTE.—Jobbers frequently cut the above prices of manufacturers for small trade.

Riddles, Hardware Grade

16 in.....per doz. $2.25@$2.50
17 in.....per doz. $2.50@$2.75
18 in.....per doz. $2.75@$3.00

Rings and Ringers—

Bull Rings—

	2	2½	3 inch.
Steel	$0.70	0.75	0.80 doz.
Copper	$1.00	1.15	1.40 doz.

Rea's Improved Self-Piercing, Copper, 2 in., ℔ doz., $1.25; 2½ in., $1.50; 3 in., $1.75.

Hog Rings and Ringers—

Hill's Rings, gro. boxes.$4.00@4.50
Hill's Ringers, Gray Iron..... doz. 50@55¢
Hill's Ringers, Malleable Iron.. doz. 70@75¢
Blair's Rings...per gro.$4.75@5.25
Blair's Ringers.per doz. $0.60@ .65
Brown's Rings..per gro.$5.00@5.50
Brown's Ringers.per doz.$0.60@ .65

Rivets and Burrs—

Copper .....50&10@60%
Iron or Steel.....75@75&5%

Rollers—

Acme, Stowell's Anti-Friction.....50%
Barn Door, Sargent's list.....60%
Cronk's Stay.....72¢
Cronk's Brinkerhoff.....90¢
Lane's Stay.....40%
Richards' Stay:
Handy Adj. and Reversible No. 53.50%
O. K. Adj. and Reversible, No. 58.50%
Lag Screw, Nos. 55 and 57.....50%
Fire Door, No. 59.....40%
Favorite, No. 54.....40%
Stowell's Barn Door Stay..℔ doz. $1.00
Swett's Anti-Friction.....50%
Screw and Spike Stay.....℔ doz. 65¢
Hinge Adjustable Stay.....℔ doz. 90¢

Rope—

Manila, 7-16 in. diam. and larger:
Pure .....lb..17¾@18¢
Sisal, 7-16 in. diam. and larger:
Mixed .....lb..8@8¼¢
Pure .....lb..9½@9¾¢
Sisal, Hay, Hide and Bale Ropes, Medium and Coarse:
Mixed .....lb..8@8¼¢
Pure .....lb..9½@9¾¢

Sisal, Tarred, Medium Lath Yarn:
Mixed ..... *lb.* 7¾¢
Pure ..... *lb.* 9@9¼¢
Cotton Rope: Lb.
Best, ¼-in. and larger ..... 16¢
Medium, ¼-in. and larger ... 14¢
Common, ¼-in. and larger . 10½¢
Jute Rope:
Thread No. 1, ¼-in. & up. lb. 6¼¢
Thread No. 2, ¼-in. & up, lb. 5¾¢
Old Colony Manila Transmission Rope ..... ℔ lb 17½¢

Wire Rope—

Galvanized ..... 42½&2½%
Plain ..... 50&2½%

Ropes, Hammocks—

Covert Mfg. Co.:
Jute ..... 50&5%
Sisal ..... 35&5%
Covert Saddlery Works..... 60&5%

Rules—

Boxwood ..... 60&10&10%
Ivory ..... 35&10@35&10&5%
Chapin-Stephens Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35@35&10&10%
Miscellaneous ..... 50@50&10&10%
Combination ..... 55@55&10%
Stationers' ..... 10@10&10%
Keuffel & Esser Co.:
Folding, Wood..... 35&10%
Folding, Steel..... 33⅓&10%
Lufkin's Steel..... 50&10%
Lufkin's Lumber..... 60%
Stanley R. & L. Co.:
Boxwood 62½%
Ivory 45%
Miscellaneous 60%
Zig Zag..... 40%
Zig Zag, Pin Joint..... 62½%
Upson Nut Co.:
Boxwood ..... 60@60&10%
Ivory ..... 35&10@35&10&10%

Sash Balances—

See *Balance, Sash.*

Sash Locks—

See *Locks, Sash.*

Sash Weights—

See *Weights, Sash.*

Sausage Stuffers or Fillers

See *Stuffers or Fillers, Sausage.*

Saw Frames—

See *Frames, Saw.*

Saw Sets—See *Sets, Saw.*

Saw Tools—See *Tools, Saw.*

Saws—

Atkins':
Circular 50%
Band ..... 50&10@60%
Cross Cuts..... 35&5%
Mulay, Mill and Drag..... 50%
One-Man Saw..... 40%
Wood Saws..... 40%
Hand, Compass, &c..... 40%
Chapin-Stephens Co.:
Turning Saws and Frames..30@30&10%
Diamond Saw & Stamping Works:
Sterling Kitchen Saws.....30&10&5%
Disston's:
Circular, Solid and Ins'ted Tooth.50%
Band, 2 to 14 in. wide..... 60%
Band, ⅛ to 1¼..... 60%
Crosscuts 50%
Narrow Crosscuts..... 55%
Mulay, Mill and Drag..... 50%
Framed Woodsaws..... 35%
Woodsaw Blades..... 35%
Woodsaw Rods..... 25%
Hand Saws, Nos. 12, 90, 9, 16, d100, D6, 120, 76, 77, 8..... 25%
Hand Saws, Nos. 7, 107, 107½, 3, 1, 0, 00, Combination..... 30%
Compass, Key Hole, &c..... 25%
Butcher Saws and Blades..... 35%
C. E. Jennings & Co.'s:
Back Saws..... 25%
Butcher Saws..... 30%
Compass and Key Hole Saws..35&5%
Framed Wood Saws..... 30%
Hand Saws..... 20&2½%
Wood Saw Blades..... 35%
Millers Falls:
Butcher Saws..... 15&10%
Star Saw Blades..... 15&10%
Peace & Richardson's Hand Saws...30%
Simonds':
Circular Saws..... 50%
Crescent Ground Cross Cut Saws..35%
One-Man Cross Cuts..... 40&10%
Gang Mill, Mulay and Drag Saws.50%
Band Saws..... 50%
Back Saws..... 25@25&7½%
Butcher Saws..... 35@35&7½%
Hand Saws..... 25@25&7½%
Hand Saws, Bay State Brand..... 45%
Compass, Key Hole, &c..25@25&7½%
Wood Saws..... 35@35&7½%
Springfield Mach. Screw Co.:
Diamond Kitchen Saws....40&10@50%
Butcher Saws Blades..... 35@40%
Wheeler, Madden & Clemson Mfg. Co.'s Cross Cut Saws..... 50%

Hack Saws—

Atkins' Hack Saw Blades A A A..25%
Disston's:
Concave Blades..... 25%
Keystone 40%
Hack Saw Frames..... 30%
Fitchburg File Works, The Best...25%
C. E. Jennings & Co.'s·
Hack Saw Frames, Nos. 175, 180..... 40&7½%
Hack Saws, Nos. 175, 180, complete, 40&7½%
Goodell's Hack Saw Blades..... 40%
Griffin's Hack Saw Frames..35&5&10%
Griffin's Hack Saw Blades....35&5&10%
Springfield Mach. Screw Co.:
Diamond Hack Saw Blades..... 35%
Diamond Hack Saw Frames..... 50%
Star Hack Saws and Blades..... 15&10%
Sterling Hack Saw Blades..... 35%
Sterling Hack Saw Frames....30&10&5%

Scroll—

Barnes' No. 7, $15..... 25%
Barnes' Scroll Saw Blades..... 40%
Barnes' Velocipede Power Scroll Saw, without boring attachment, $18; with boring attachment, $20..... 20%
Lester, complete, $10.00..... 15&10%
Rogers, complete, $6.00..... 15&10%

Scalers, Fish—

Covert's Saddlery Works..... 60&10%

Scales—

Family, Turnbull's....50@50&10%
Counter:
Hatch, Platform, ½ oz. to 4 lbs. ..... *doz.* $5.50
Two Platforms, ½ oz. to 8 lbs. ..... *doz.* $16.00
Union Platform, Plain.$1.70@1.90
Union Platform, Stpd.$1.85@2.15
Chatillon's:
Eureka 25%
Favorite 40%
Crocers' Trip Scales..... 50%
Chicago Scale Co.:
The "Little Detective"....25 lbs 50%
Union or Family No. 2..... 60%
Portable Platform (reduced list)..50%
Wagon or Stock (reduced list).25@35%
"The Standard" Portables..... 50%
"The Standard" R. R. and Wagon.50%

Scrapers—

Box, 1 Handle.....*doz.* $2.00@2.25
Box, 2 Handle.....*doz.* $2.60@2.85
Ship....*Light, $2.00; Heavy, $4.50*
Adjustable Box Scraper (S. R. & L. Co.), $6.00..... 45%
Chapin-Stephens Co., Box....50@50&10%

Screens, Window and Frames—

Air Line Pattern Screens..... 60&10%
Flyer Pattern Screens..60&10@60&10&5%
Maine Screen Frames..... 40&10&5%
Perfection Screens..... 60&10@60&10&5%
Phillips' Screen Frames...60&5@60&10%
See also *Doors.*

Screws—Bench and Hand

Bench, Iron, doz., 1 in., $2.50@ 2.75; 1½, $3.00@3.25; 1¼, $3.50@3.75
Bench, W'd, Beech. doz. 30@30&5%
Hand, Wood..... *30@30&5%*
R. Bliss Mfg. Co., Hand....30@30&10%
Chapin-Stephens Co., Hand..30@30&10%
Ohio Tool Co., Bench and Hand..30%

Coach, Lag and Hand Rail—

Lag, Cone Point, list Oct. 1, '99 ..... 75&20%
Coach, Gimlet Point, list Oct. 1, '99..... 75&15%
Hand Rail, list Jan. 1, '81..... 70&10@75%

Jack Screws—

Standard List.....75&10@80&5%
Millers Falls..... 50&10&10%
Millers Falls, Roller..... 50&10%
P., S. & W..... 50@50&5%
Sargent ..... 70&10%
Swett Iron Works..... 75&10@80&5%

Machine—

List Jan. 1, '98:
Flat or Round Head, Iron.... 50@50&10%
Flat or Round Head, Brass.... 50@50&10%

Set and Cap—

Set (Iron or Steel)..80@80&10&10%
Sq. Hd. Cap..... 75@75&10%
Hex. Hd. Cap..... 75@75&10%
Rd. or Fillister Hd. Cap..... 65@65&10%

Wood—

List July 23, 1903.
Manufacturers' printed discounts:
Flat Head, Iron.....87½&10@..%
Round Head, Iron...85 &10@..%
Flat Head, Brass...85 &10@..%
Round Head, Brass..80 &10@..%
Flat Head, Bronze...77½&10@..%
Round Head, Bronze.75 &10@..%
Drive Screws..... 87½&10%

Scroll Saws—

See *Saws, Scroll.*

Scythes—

Per doz.
Prices announced for next season:
Clipper Pattern, Grass..... $6.20
Full Polished, Clipper..... $6.75
Grain $8.00
Clipper, Grain..... $8.25
Weed and Bush..... $6.25

Seeders, Raisin—

Enterprise ..... 25@30%

Sets—Awl and Tool—

Brad Awl and Tool Sets:
Wood Handle, 10 Awls, doz. $2.00
Wood Handle, 1¼ Awls, 6 Tools ..... *doz.* $2.40
Aiken's Sets, Awl and Tools:
No. 20, ℔ doz. $10.00.....50&10&10%
Fray's Adj. Tool Handles, Nos. 1, $12; 2, $18; 3, $12; 4, $9; 5, $7..... 50%
C. E. Jennings & Co.'s Model Tool Holders 30%
Millers Falls Adj. Tool Handles, No. 1, $12; No. 4, $12; No. 5, $18....15&10%

Garden Tool Sets—

Ft. Madison Three Plows, Hoe, Rake and Shovel..... ℔ doz sets $9.00

Nail—

Square ..... *per gro.* $2.25@2.50
Round, Blk. and Pol., assorted. gro. $1.80@2.00
Octagon ..... *gro.* $3.50@3.75
Buck Bros..... 27½%
Cannon's Diamond Point, ℔ gro. $12..25%
Mayhew's ..... ℔ gro. $9.00
Snell's Cannon's Diamond Point..... ℔ gro. $7.20
Snell's Cor'gated, Cup Pt...℔ gro. $7.20
Snell's Knurled, Cup Pt....℔ gro. $7.20
Springfield Mach. Screw Co.:
Diamond Knurled Cup Pt. ℔ gro. $7.50

Rivet—

Regular list..... 75@75&10%

Saw—

Aiken's:
Genuine ..... 50&10%
Imitation ..... 50&10%
Atkin's:
Criterion 40%
Adjustable 40%
Bemis & Call Co.'s:
Cross Cut..... 30%
Plate 20%
Disston's Star and Monarch..... 25%
Morrill's No. 1, $15.00..... 50%
Nos. 3 and 4, Cross Cut, $20.63....50%
No. 5, Mill, $30.00..... 50%
Nos. 10, 11, 95, $15.63..... 50%
No. 1 Old Style, $10.00..... 50%
Special, $16.25..... 50%
Giant Royal, Cross Cut..... ℔ doz. $8.50
Royal, Hand..... ℔ doz. $5.00
Taintor Positive..... ℔ doz. $6.75

Shaving

Fox Shaving Sets, No. 30 ..... ℔ doz., net, $24.00

Sharpeners, Knife—

Chicago Wheel & Mfg. Co.....65%

Shaves, Spoke—

Iron ..... *doz.* $1.10@1.25
Wood ..... *doz.* $1.75@2.25
Bailey's (Stanley R. & L. Co.)..... 45%
Razor Edge (Stanley R. & L. Co.)..35%
Chapin-Stephens Co.....30@30&10&10%
Goodell's, ℔ doz. $9.00..... 15&10%
Wood's F1 and F2..... 50%

Shears—

Cast Iron..	7	8	9 *in.*
Best	$16.00	18.00	20.00 *gro.*
Good ...	$13.00	15.00	17.00 *gro.*
Cheap ..	$5.00	6.00	7.00 *gro.*

Straight Trimmers, &c.:
Best quality, Jap.... 70@40&10%
Best quality, Nickel..60@60&10%
Fair quality, Jap.... 80@80&5%
Fair quality, Nickel..75@75&10%
Tailors' Shears..... 40@40&10%
Acme Cast Shears..... 40@40&5%
Heinisch's Tailor's Shears..... 10%
Wilkinson's Hedge, 1900 list..... 45%
Wilkinson's Branch, Lawn & Border.60%
Wilkinson's Sheep, 1900 list..... 50%

Tinners' Snips—

Steel Blades.....20&5@20&10%
Steel Laid Blades.....40&10@50%
Forged Handles, Steel Blades, Berlin, 40@40&10%
Heinisch's Snips..... 40%
Jennings & Griffin Mfg. Co.'s, 6½ to 10 in..... 50%
Niagara Snips..... 40%
P., S. & W. Co..... 20%

Pruning Shears and Tools

Cronk's Grape Shears..... 33⅓%
Cronk's Pruning Shears..... 33⅓%
Disston's Combined Pruning Hook and Saw, ℔ doz. $18.00..... 25%
Disston's Pruning Hook, ℔ doz. $12.00 ..... 25%
John T. Henry Mfg. Co.:
Pruning Shears, all grades..40@40&5%
Orange Shears.....50&10@50&20%
Grape ..... 40&10@50%
Tree Pruners..... 75%
P., S. & W. Co..... 33⅓%

Sheaves—Sliding Door—

Stowell's Anti-Friction..... 50%
Patent Roller, Hatfield's, Sargent's list ..... 70&10%
Reading 60%
R. & E. list..... 33⅓%
Wrightaville Hatfield Pattern..... 60%

Sliding Shutter—

Reading list..... 45&20%
R. & E. list..... 33⅓%
Sargent's list..... 50&10%

Shells—Shells, Empty—

Brass Shells, Empty:
First quality, all gauges..... 60&5%
Climax, Club, Rival, 10 and 12 gauge ..... 65&5%
Paper Shells, Empty:
Acme, Ideal, Leader, New Rapid, Magic, 10, 12, 16 and 20 gauge.25&5%
Blue Rival, New Climax, Challenge, Monarch, Defiance, Repeater, Yellow Rival, 10, 12, 16 and 20 gauge..20%
Climax, Union, League, New Rival, 10 and 12 gauge..... 25%
Climax, Union, League, New Rival, 14, 16 and 20 gauge ($7.50 list)..20%
Expert, Metal Lined and Pigeon, 10, 12, 16 and 20 gauge..... 33⅓&5%
Robin Hood, Low Brass..... 20&10%
Robin Hood, High Brass..... 30&10%

Shells, Loaded—

Loaded with Black Powder..40%
Loaded with Smokeless Powder, medium grade..... 40&5%
Loaded with Smokeless Powder, high grade..... 40&10&10%
Robin Hood Smokeless Powder:
Robin Hood, Low Brass..... 50%
Comets, High Brass..... 50&10&5%

Shoes, Horse, Mule, &c.—

F.o.b. Pittsburgh:
Iron ..... per keg $4.00
Steel ..... per keg $3.75
Burden's, all sizes..... ℔ keg $3.90

Shot—

Drop, up to B, 25-lb. bag....$1.65
Drop, B and larger..... *per 25-lb. bag,* $1.90
Buck, 25-lb. bag..... $1.90
Chilled, 25-lb. bag..... $1.90

Shovels and Spades—

Association List, Nov. 15, 1902..40%

Sieves and Sifters—

Hunter's Imitation..... *gro.* $10.50@11.00
Hunter's Genuine..... *per gro.* $12.00@12.50
Buffalo Metallic Blued, S. S. Co., ℔ gr.:

14&16	16&18	18&20
$13.20	$13.50	$14.40

Shaker (Barler's Pat.) Flour Sifters, ℔ doz., $2.00..... 20%

Sieves, Seamless Metallic

	—Per dozen.—			
Mesh	14	16	18	20
Iron Wire...	$1.05	1.05	1.10	1.20
Tinned Wire..	$1.15	1.15	1.20	1.30

Sieves, Wooden Rim—

Nested, 10, 11 and 12 Inch.
Mesh 18, Nested....*doz.* $0.90@10.95
Mesh 20, Nested....*doz.* $1.00@1.05
Mesh 24, Nested....*doz.* $1.30@1.40

Sinks, Cast Iron—

Standard list.....60@60&10%
NOTE.—There is not entire uniformity in lists used by jobbers.

Skeins, Wagon—

Cast Iron.....80&10@80&10&10%
Steel ..... 40@40&10%

Slates, School—

Factory Shipments.
"D" Slates.....50@50&10%
Eureka, Unexcelled Noiseless.. 60&5 *tens*
Victor A, Noiseless..... 60&5 *tens* &5%

Slaw Cutters—See *Cutters.*

Snaps, Harness—

German ..... 40@40&10%
Covert Mfg. Co.:
Derby ..... 30&5&2%
High Grade..... 45%
Jockey ..... 30&10%
Trojan 45%
Yankee ..... 30&5&2%
Yankee, Roller..... 30&5&2%
Covert's Saddlery Works:
Crown 60%
German 60%
Model 60%
Triumph 60%
Oneida Community:
Solid Swivel..... 60%
Sargent's Patent Guarded....66⅔&10%

Snaths—

Scythe 50%

Snips, Tinners—See *Shears.*

Spoons and Forks—Silver Plated—

Good Quality.....50&10@60&5%
Cheap ..... 60@60&10%
International Silver Co.:
1847 Rogers Bros. and Rogers & Hamilton ..... 40&10%
Rogers & Bro., William Rogers' Eagle Brand..... 50&10%
Anchor, Rogers Brand..... 60%
Wm. Rogers & Son..... 60&10%

Miscellaneous—

German Silver..... 60@60&5%
Cattaraugus Cutlery Co.:
Seneca Silver..... 50%

Tinned Iron—

Teas ..... *per gro.* 45@50¢
Tables ..... *per gro.* $0.90@$1.00

Springs—Door—

Chicago (Coil)..... 40&10%
Gem (Coil)..... 20%
Pullman (Coil)..... 20%
Reliance (Coil)..... 40&10%
Star (Coil)..... 30%
Torrey's Rod, 39 in..... ℔ doz. $1.10
Victor (Coil)..... 50&10&10%

Carriage, Wagon, &c.—

1¼ in. and Wider: *Per lb*
Black ..... 4@4¼¢
Half Bright..... 4@4¼¢
Bright ..... 4½@4¾¢
Painted Seat Springs:
1½ x 2 x 26..... *per pr.* 42¢
1½ x 3 x 28..... *per pr.* 70¢

Sprinklers, Lawn—

Enterprise ..... 25@30%
Philadelphia No. 1, ℔ doz. $12; No. 2, $15; No. 3, $24..... 30%

Squares—

Nickel plated.. } *List Jan. 5, 1900.*
Steel and Iron. } 75@75&5%
Rosewood Hdl. Try Square and T-Bevels ..... 60&10&10@70%
Iron Hdl. Try Squares and T-Bevels ..... 40&10@40&10&10%
Disston's Try Sq. and T-Bevels....70%
Winterbottom's Try and Miter, No. 1, 40%; No. 2..... 50%

Squeezers, Lemon

Wood, Common, gro., No. 0, $5.25@$5.50; No. 1, $6.25@$6.50.
Wood, Porcelain Lined:
Cheap ..... *doz.* $1.00
Good Grade..... *doz.* $1.25
Tinned Iron..... *doz.* $0.75@1.25
Iron, Porcelain Lined...*doz.* $1.75

Staples—

Barbed Blind..... *lb.* 6@6½¢
Electricians', Association list.. 80&10&10&10%
Fence Staples, Plain, $2.25; Galvanized $2.55
Poultry Netting Staples..... *per lb.* 3¼@3¼¢
Grand Crossing Tack Co.'s list..80&10%

Steels, Butchers'—

Dick's 30%
Foster Bros.'..... 30%
C. & A. Hoffmann's..... 40%

Steelyards—....30@30&10%

Stocks and Dies—

Blacksmiths'..... 50@50&10%
Curtis Rev'ble Ratchet Die Stock..25%
Derby Screw Plates..... 25%
Gardner Die Stocks No. 1..... 50%
Gardner Die Stocks, larger sizes....40%
Green River..... 25%
Lightning Screw Plate..... 25%
Little Giant..... 25%
Reece's New Screw Plates..... 25%

Stone—Scythe Stones—

Chicago Wheel & Mfg. Co.:
Gem Corundum, 10 in., $6.00 ℔ gro., 12 in., $10.80.
Norton Emery Scythe Stones:
Less than gross lots..... ℔ gro. $9.00
One gross or more..... ℔ gro. $7.20
Lots of 10 gross or more..℔ gro. $6.00

Pike Mfg. Co., 1901 list:
Black Diamond S. S. ..⅓ gro. $12.00
Lamoille S. S.....½ gro. $11.00
White Mountain S. S.½ gro. $9.00
Green Mountain S. S..½ gro. $6.00
Extra Indian Pond S.S.½ gro. $7.50
No. 1 Indian Pond S.S.½ gro. $7.00
No. 2 Indian Pond S.S.½ gro. $4.50
Leader Red End S. S.½ gro. $4.50
Emery and Corundum, 10 in.. ½ gro. $9.00 — 33⅓%
Pure Corundum, 10 in., ½ gro. $12
Crescent $7.00
Emery Scythe Rifles, 2 Coat. $8
Emery Scythe Rifles, 3 Coat. $10
Emery Scythe Rifles, 4 Coat. $12
Balance of 1904 list 33⅓%

Oil Stones, &c.—

Chicago Wheel & Mfg. Co., 1901 list:
Gem Corundum Oil, Double Grit.50%
Gem Corundum Axe, Single or Double Grit.....55%
Gem Corundum Slips.....55%
Gem Corundum Razor Hones...50%
Pike Mfg. Co., 1901 list: ½ lb.
Arkansas St. No. 1, 3 to 5½ in.$2.80
Arkansas St. No. 1, 5½ to 8 in.$3.50
Arkansas Slips No. 1.....$4.00
Lily White Washita, 4 to 8 in.60¢
Rosy Red Washita, 4 to 8 in..60¢ — 33⅓%
Washita St., Extra, 4 to 8 in.50¢
Washita St., No. 1, 4 to 8 in.40¢
Washita St., No. 2, 4 to 8 in.30¢
Lily White Slips.....90¢
Rosy Red Slips.....90¢
Washita Slips, Extra.....80¢
Washita Slips, No. 1.....70¢
Washita Slips, No. 2.....40¢
India Oil Stones (entire list)...33⅓%
Quickcut Emery and Corundum Oil Stone, Double Grit.....33⅓%
Quickcut Emery and Corundum Axe Stone, Double Grit.....33⅓%
Quickcut Emery Rubbing Bricks.33⅓%
Hindostan No. 1, R'g'lar.½ lb 8¢
Hindostan No. 1, Small..½ lb 10¢
Axe Stones (all kinds).....
Turkey Oil Stones, Extra, 5 to 8 in.....½ lb 80¢ — 33⅓%
Queer Creek Stones, 4 to 8 in.20¢
Queer Creek Slips.....40¢
Sand Stone.....6¢
Belgian, German and Swaty Razor Hones 50%
Natural Grit Carving Knife Hones .....½ doz. $3.00
Quick Edge Pocket Knife Hones .....½ doz. $2.50 — 40%
Mounted Kitchen Sand Stone. ½ doz. $1.50

Stoners, Cherry—

Enterprise .....25@30%

Stoppers, Bottle—

Victor Bottle Stoppers.....½ gro. $9.00

Stops— Bench—

Millers Falls.....15&10%
Morrill's, ½ doz., No. 1, $10.00.....50%
Morrill's, No. 2, $12.50.....50%

Door—

Chapin-Stephens Co.....60@60&10%

Plane—

Chapin-Stephens Co.....20%

Straps— Box—

Cary's Universal, case lots..20&10&10%

Hame—

Covert's Saddlery Works.....60&10%

Stretchers, Carpet—

Cast Iron, St'l Points, doz. 55@60%
Socket .....doz. $1.75
Excelsior Stretcher and Tack Hammer Combined, ½ doz. $6.00.....20%

Stuffers, Sausage—

Enterprise Mfg. Co.....25@25&7½%
National Specialty Co., list Jan. 1, 1902 .....30&5%

Sweepers, Carpet—

National Sweeper Co.: ½ doz.
Auditorium, Roller Bearing (26 in. case), Nickel.....$54.00
Mammoth, Roller Bearing (30 in. case), Nickel.....$60.00
Marion, Roller Bearing, regular finishes, full Nickel.....$24.00
Marion Queen, Roller Bearing, full Nickel $24.00
Monarch, Roller Bearing, N'kel.$22.00
Monarch, Roller B'r'g, Jap'ned.$20.00
Transparent, Roller Bearing, Plate Glass Top, Nickel.....$36.00
Monarch Extra, Roller Bearing, (17-in. case), Nickel.....$36.00
Monarch Extra, Roller Bearing (17-in. case), Japanned.....$33.00
National Queen, Fancy Veneers.$27.00
Perpetual, Regular B'r'gs, Nkl..$20.00
Perpetual, Regular B'r'gs, Jap.$18.00
Triple Medal.....$24.00
NOTE.—Rebates: 50c per dozen on three-dozen lots; $1 per dozen on five-dozen lots; $2 per dozen on ten-dozen lots; $2.50 per dozen on twenty-five-dozen lots.

Tacks, Brads, &c.—

List Jan. 15, '99.
Carpet Tacks.....90&25&5@..%
American Cut Tacks.90&20&5@..%
Swedes Cut Tacks..90&35&5@..%
Swedes Upholsterers' Tacks..... 90&10&5@..%
Gimp Tacks.....90&15&5@..%
Lace Tacks.....90&15&5@..%
Trimmers' Tacks...90&33&5@..%
Looking Glass Tacks..85&5@..%
Bill Posters' and Railroad Tacks .....90&15&5@..%
Hungarian Nails....80&20&5@..%
Common and Patent Brads... 80&10&5@..%
Trunk and Clout Nails.80&10@..%
NOTE.—The above prices are for Straight Weights. An extra 5% is given on Star Weights** and an extra 10&5% on Standard Weights.****

Miscellaneous—

Double Pointed Tacks..... 90&6 or 7 tens
Steel Wire Brads, R. & E. Mfg. Co.'s list .....50&10@60%
See also Nails, Wire.

Tanks, Oil—

	Each.
Emerald, S., S. & Co.....30-gal.	$3.40
Emerald, S., S. & Co.....60-gal.	$4.25
Queen City, S., S. & Co....30-gal.	$3.65
Queen City, S., S. & Co....60-gal.	$4.50

Tapes, Measuring—

American Asses' Skin..40&10@50%
Patent Leather.....25@30&5%
Steel .....40@40&10%
Chesterman's .....25@25&5%
Eddy Asses' Skin.....40&10@50%
Eddy Patent Leather.....25@30&5%
Eddy Steel.....40@40&10%
Keuffel & Esser Co.:
Favorite, Ass Skin.....40&10@50%
Favorite, Duck and Leather..... 25&5@25&10%
Metallic and Steel, lower list..... 35@35&5%
Pocket .....35@35&5%
Lufkin's:
Asses' Skin.....40&10@50%
Metallic .....30@30&5%
Patent Bend, Leather....25&5@25&10%
Pocket .....40@40&5%
Steel .....33⅓@35%

Teeth, Harrow—

Steel Harrow Teeth, plain or headed, ⅝-inch and larger... per 100 lbs. $3.00

Thermometers—

Tin Case.....80&10@80&10&5%

Ties, Bale—Steel Wire—

Single Loop.....80&2½%
Monitor, Cross Head, &c....70%

Brick Ties—

Niagara Brick Ties.....25&10%

Tinners' Shears, &c.—

See *Shears, Tinners', &c.*

Tinware—

Stamped, Japanned and Pieced, sold very generally at net prices.

Tips, Safety Pole—

Covert's Saddlery Works.....60&10%

Tire Benders, Upsetters, &c.

See *Benders and Upsetters, Tire.*

Tools—Coopers'—

L. & I. J. White.....20@20&5%

Hay—

Myers' Hay Tools.....50%
Stowell's Hay Carriers.....50%
Stowell's Hay Forks.....50%
Stowell's Fork Pulleys.....50%

Saw—

Atkins' Cross Cut Saw Tools.....40%
Simonds' Improved.....33⅓%
Simonds' Crescent.....25%

Ship—

L. & I. J. White.....25%

Transom Lifters—

See *Lifters, Transom.*

Traps—Fly—

Balloon, Globe or Acme, doz. $1.15@$1.25; gro.....$11.50@12.00
Harper, Champion or Paragon, doz. $1.25@1.40; gro. $13.00@13.50

Game—

Oneida Pattern...75&10@75&10&5%
Newhouse .....45@45&5%
Hawley & Norton.....65%
Victor and Oneida.....70&10@70&10&5%
O. C. Jump (Blake Pat.)..60&5@60&10%

Mouse and Rat—

Mouse, Wood, Choker, doz. holes 81¼@9¢
Mouse, Round or Square Wire, doz. 85@90¢
Marty French Rat and Mouse Traps (Genuine):
No. 1, Rat, each $1.21; ½ doz. $13.25
No. 3, Rat, ½ doz. $6.50; case of 50 $5.75 doz.
No. 3½, Rat, ½ doz. $5.25; case of 72 ½ gro. $4.70 doz.
No. 4, Mouse, ½ doz. $3.85; case of 150 $3.00 doz.
No. 5, Mouse, ½ doz. $3.00; case of 150 $2.25 doz.

Trimmers, Spoke—

Wood's E I.....50%

Trowels—

Disston Brick and Pointing.....30%
Disston Plastering.....25%
Disston "Standard Brand" and Garden Trowels.....35%
Kohler's Steel Garden Trowels, 5 in. ½ gro. $4.80
Kohler's Steel Garden Trowels, 6 in. ½ gro. $6.00
Never-Break Steel Garden Trowels.. ½ gro. $6.00
Rose Brick and Plastering.....25&5%
Woodrough & McParlin, Plastering.25%

Trucks, Warehouse, &c.—

B. & L. Block Co.:
New York Pattern.....50&10%
Western Pattern.....60&10%
Handy Trucks.....½ doz. $16.00
Grocery .....½ doz. $15.00
Daisy Stove Trucks, Improved Pattern .....½ doz. $18.50
McKinney Trucks.....each $10.00
Model Stove Trucks.....½ doz. $18.50

Tubs, Wash—

No.	1	2	3
Galvanized, per doz.	*$4.75*	*5.25*	*6.00*
Galvanized Wash Tubs (S., S. & Co.):			
No.	1	2	3 10 30
Per doz., net.	$5.70	6.30	7.20 6.60 7.20 8.10

Twine, Miscellaneous—

Flax Twine:	*BC.*	*B.*
No. 9, ¼ and ½-lb. Balls	*.22@24¢*	
No. 12, ¼ and ½-lb. Balls	*.18@20¢*	
No. 18, ¼ and ½-lb. Balls	*.16@18¢*	
No. 24, ¼ and ½-lb. Balls	*.16@18¢*	
No. 36, ¼ and ½-lb. Balls	*.15@17¢*	
Chalk Line, Cotton ½-lb. Balls	*.30¢*	
Cotton Mops, 6, 9, 12 and 15 lb. to doz.	*.9½@11¢*	
Cotton Wrapping, 5 Balls to lb., according to quality..	*13½@20¢*	
American 2-Ply Hemp, ¼ and ½-lb. Balls	*.13@14¢*	
American 3-Ply Hemp, 1-lb. Balls	*.13@14¢*	
India 2-Ply Hemp, ¼ and ½-lb. Balls (Spring Twine)	*.9½¢*	
India 3-Ply Hemp, 1-lb. Balls	*.8½¢*	
India 3-Ply Hemp, 1½-lb. Balls.	*7@8¢*	
2, 3, ¼ and 5-Ply Jute, ½-lb. Balls	*.9@10¢*	
Mason Line, Linen, ½-lb. Bls	*.46¢*	
No. 26½ Mattress, ¼ and ½-lb. Balls	*.37¢*	
Wool, 3 to 6 ply....B 4½¢; A 5¢		

Vises—

Solid Box.....60&10@60&10&10%

Parallel—

Athol Machine Co.:
Simpson's Adjustable.....40%
Standard 40%
Amateur 25%
Columbian Hdw. Co.....40%
Emmert Universal:
Pattern Makers' No. 1, $15.00; No. 2 $12.50; No. 3, $10.00.
Machinist and Tool Makers' No. 4, $12.50; No. 5, $7.00; No. 6, $10.00; No. 10, $21.50.
Jewelers' No. 7.....$4.00
Fisher & Norris Double Screw..15&10%
Hollands':
Machinists' .....40@40&5%
Keystone .....65&5&70%
Lewis Tool Co.....20&30%
Merrill's 20%
Millers Falls.....60&10%
Massey Vise Co.:
Clincher 40%
Perfect 20%
Lightning Grip.....20%
Parker's:
Victor .....20@25%
Regulars .....20@25%
Vulcan's .....40@45%
Combination Pipe.....55@60%
Prentiss .....20@25%
Sargent's 40%
Smith & Hemenway Co.:
Machinists' 40%
Jewelers' 33⅓%
Snediker's X. L.....33⅓%
Stephens' 33⅓%

Saw Filers—

Disston's D 3 Clamp and Guide, ½ doz. $30.....25%
Perfection Saw Clamps, ½ doz....$5.00
Reading 60%
Wentworth's Rubber Jaw, Nos. 1, 2 and 3.....45&50%

Wood Workers—

Massey Vise Co.:
Lightning Grip.....15%
Perfect 15%
Wyman & Gordon's Quick Action, 6 in., $6.00; 9 in., $7.00; 14 in., $8.00.

Miscellaneous—

Bignall & Keeler Combination Pipe Vise .....60&10%
Holland's Combination Pipe..60@60&5%
Massey's Quick Action Pipe.....40%
Parker's Combination Pipe:
87 Series.....60%
187 Series.....60&5%
No. 870.....40%

Wads—*Price per M.*

B. E., 11 up.....60¢
B. E., 9 and 10.....70¢
B. E., 8.....80¢
B. E., 7.....80¢
P. E., 11 up.....$1.00
P. E., 9 and 10.....1.25
P. E., 8.....1.50
P. E., 7.....1.50
Dis. 15%
Ely's B. E., 11 and larger.$1.70@1.75
Ely's P. E., 12 to 20....$3.00@3.25

Ware, Hollow—Cast Iron, Hollow—

Stove Hollow Ware:
Enameled .....50@55&10%
Ground .....55@60&10%
Plain or Unground..60@65&10%
Country Hollow Ware, per 100 lbs. .....$2.75@3.00
White Enameled Ware:
Maslin Kettles.....70%
Covered Wares
Tinned and Turned.....40%
Enameled 50%
See also *Pots, Glue.*

Enameled—

Agate Nickel Steel Ware.....50&20%
Agate Nickel Steel Ware, Specials.. 60&15%
Iron Clad Ware.....70&10%
Lava, Enameled.....40&10%
Never Break Enameled.....50%

Tea Kettles—

Galvanized Tea Kettles:

Inch.....	*6*	*7*	*8*	*9*
Each	*45¢*	*50¢*	*55¢*	*65¢*

Steel Hollow Ware—

Avery Spiders and Griddles..65@65&5%
Avery Kettles.....60%
Porcelained .....50&5&50&10%
Never Break Spiders and Griddles.. 65&5%
Never Break Kettles.....60%
Solid Steel Spiders and Griddles.65&5%
Solid Steel Kettles.....60%

Warmers, Foot—

Pike Mfg. Co., Soapstone....40@40&10%

Washboards—

Solid Zinc: ½ doz.
Crescent, family size, bent frame.$3.25
Red Star, family size, stationary protector $3.25
Double Zinc Surface:
Saginaw Globe, family size, stationary protector.....$2.90
Cable Cross, family size, stationary protector.....$3.15
Single Zinc Surface:
Naiad, family size, open back, perforated $2.65
Saginaw Globe, protector, family size, ventilated back.....$2.50
Brass Surface:
Brass King, Single Surface, open back $3.25
Nickel Plate Surface:
No. 1001 Nickel Plate, Single Surface $3.25
Glass Surface:
Glass King, Single Surface, open back $3.25
Enamel Surface:
Enamel King, Single Surface, ventilated back.....$3.25

Washers—Leather, Axle—

Solid .....80&10@80&10&10%
Patent .....90@90&5%
Coil: ⅞ 1 1¼ 1¼ inch.
10¢ 11¢ 12¢ 13¢ per box

Iron or Steel—

Size bolt.... 5-16 ⅜ ½ ⅝ ¾
Washers ...$4.95 4.05 2.75 2.55 2.35
In lots less than one keg add ½¢ per lb.; 5-lb. boxes add 1½¢ to list.

Cast Washers—

Over ½ inch, barrel lots..... per lb. 1¾@2¢

Wedges—

Oil Finish.....lb. 2.15@2.30¢

Weights—Hitching—

Covert Mfg. Co.....40&2%
Covert's Saddlery Works.....60&10%

Sash—

Per ton, f.o.b. factory:
Eastern District..... $25.00
Southern Territory..$19.00@20.00
Western and Central Districts .....$20.00@21.00

Wheels, Well—

8-in., $1.50@1.55; 10-in., $1.65@1.70; 12-in., $2.25@2.35; 14-in., $3.40@3.50.

Wire and Wire Goods—

Bright and Annealed:
6 to 9.....80&5@80&5&7½%
10 to 18.....80@80&5%
19 to 26.....80&10@80&10&5%
27 to 36.....80&5@80&10%
Galvanized:
6 to 9.....77½@77½&5%
10 to 14.....72½@72½&5%
15 to 16.....75&7½@75&10&2½%
19 to 26.....75&5@75&10%
27 to 36.....72½&5@72&7½%
Coppered:
6 to 9.....77½@77½&5%
10 to 14.....77½@77½&7½%
15 to 18.....75&10@75&10&2½%
19 to 26.....75&10&5@80%
27 to 36.....75@75&5%
Tinned:
6 to 14.....77½@77½&7½%
15 to 18.....75&5@75&10%
Annealed, Steel and Tinned, on Spools ..70&10&10@70&10&10&10%
Brass and Copper on Spools... 60&10@60&10&10%
Brass, list Feb. 26, '96....30&5%
Copper, list Feb. 26, '96.....15%
Cast Steel Wire.....50%
Wire Clothes Line, see Lines.
Wire Picture Cord, see Cord.

Bright Wire Goods—

List June 24, 1903..90&10&10&10@..%

Wire Cloth and Netting—

Galvanized Wire Netting..... 80&15@80&17½%
Painted Screen Cloth, 100 ft., $1.20
Standard Galv. Hardware Grade:
Nos. 2, 2½ & 3 Mesh, sq. ft..3 ¢
Nos. 4 and 5 Mesh, sq. ft..3¼ ¢
No. 6 Mesh, sq. ft.....3½ ¢
No. 8 Mesh, sq. ft.....4 ¢

Wire, Barb—See *Trade Report*

Wrenches—

Agricultural ....75&10@75&10&10%
Alligator or Crocodile..70&10@75%
Baxter Pattern S Wrenches... 70&5@70&10%
Drop Forged S.....45@45&5%
Acme .....60&10
Alligator Pattern.....70%
Bull Dog.....70%
Bemis & Call's:
Adjustable S.....40%
Adjustable S Pipe.....40%
Bemis Pipe.....60
Briggs Pattern.....40
Combination Black.....40&5
Combination Bright.....40
Merrick Pattern.....50
Boardman's 33⅓%
Coes' Genuine Knife Hdl..40&10&5&5
Coes' Genuine Steel Hdl..40&10&5&5
Coes' Genuine Key Model..40&10&5&5
Coes' "Mechanics'"...40&10&10&5&5
Donohue's Engineer.....40&10
Eagle .....50&10
Elgin Wrenches.....40%
Elgin Monkey Wrench Pipe Jaws.33⅓%
Gem Pocket.....30
Hercules 70
W. & B. Machinist:
Case lots.....50&5
Less than case lots.....50
Improved Pipe (W. & B.).....60
Solid Handles, P., S. & W..50&50&5
Stillson 65
Vulcan Chain.....50%

Fruit Jar—

Triumph Fruit Jar Wrench, 5 gross lots, ½ gross, $7.50; ½ doz.....$0.80

Wrought Goods—

Staples, Hooks, &c., list March 17, '92.....90@90&10%

Yokes, Neck—

Covert Saddlery Works, Trimmed..70%
Covert Saddlery Works, Neck Yoke Centers 70%

Yokes, Ox, and Ox Bows—

Fort Madison's Farmers' & Freighters' .....list net

Zinc—

Sheet.....per 100 lbs. $7.75@8.00